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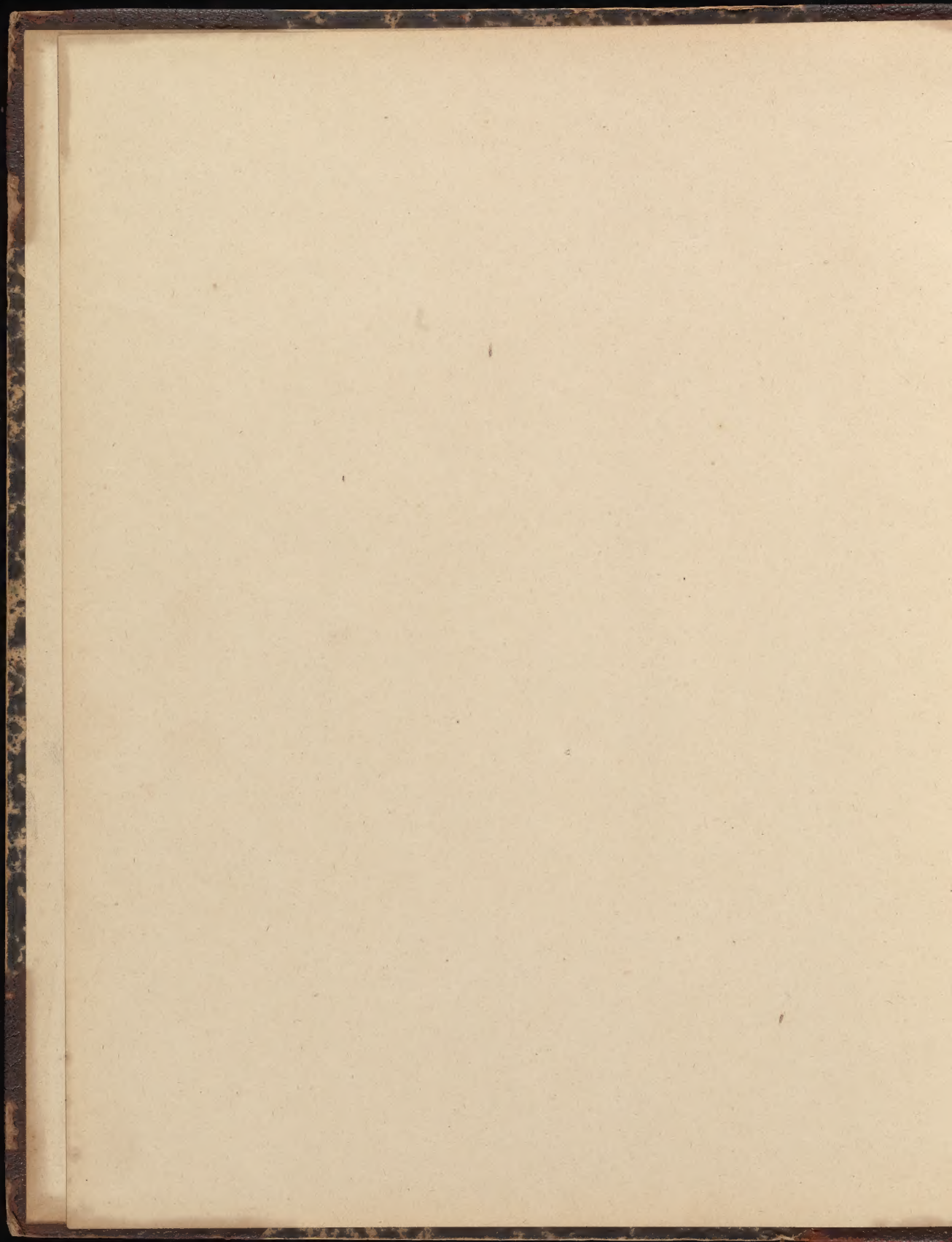
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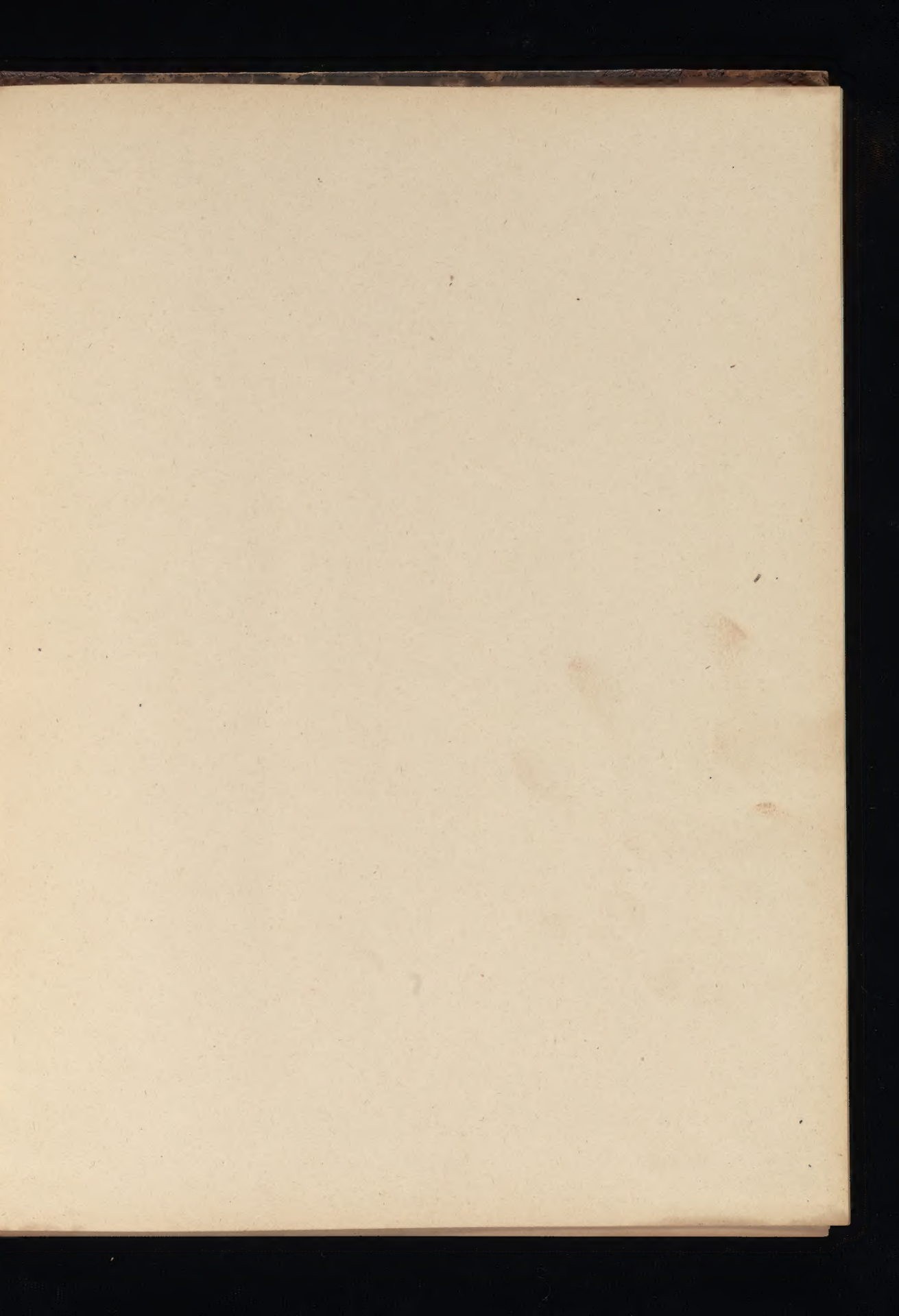
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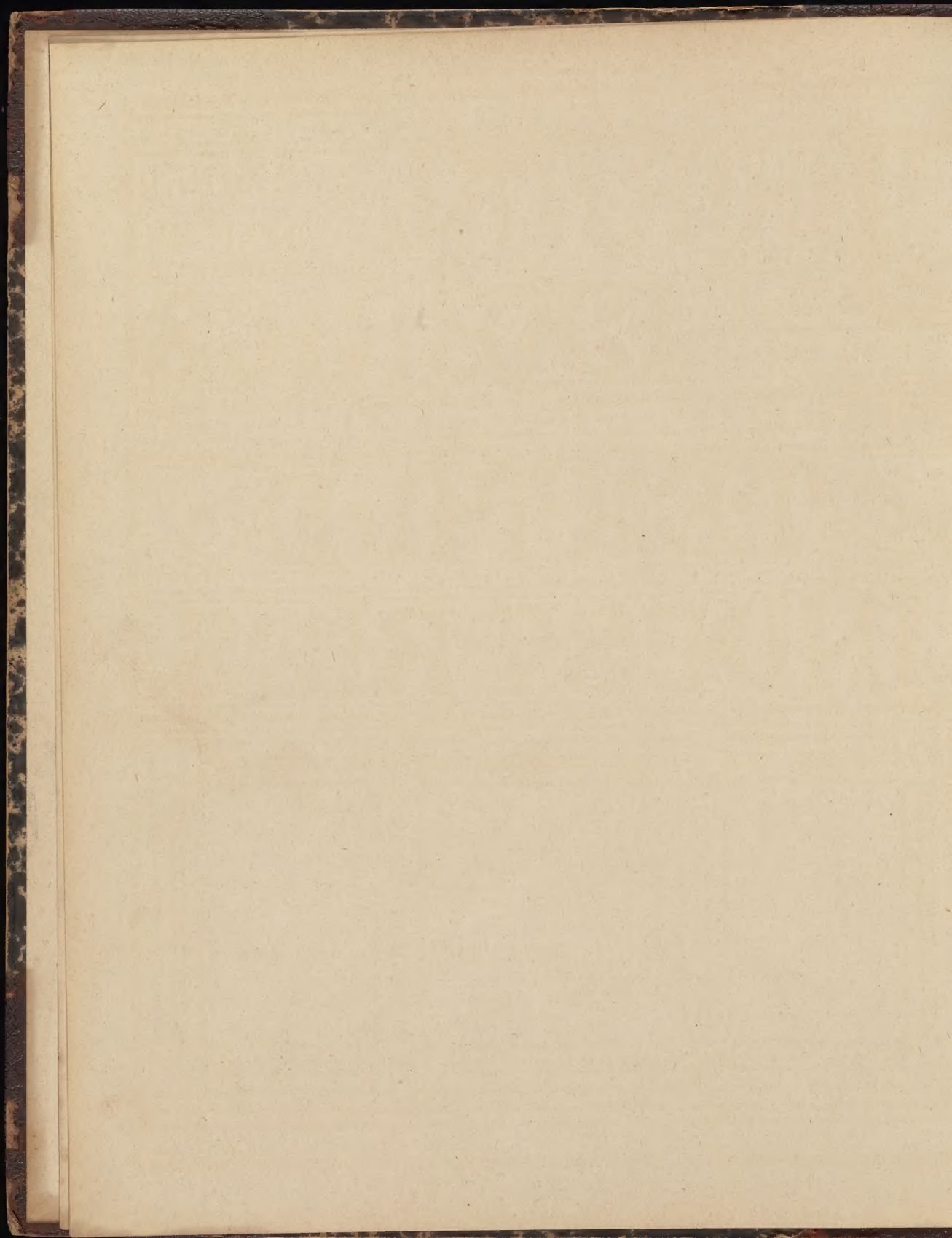
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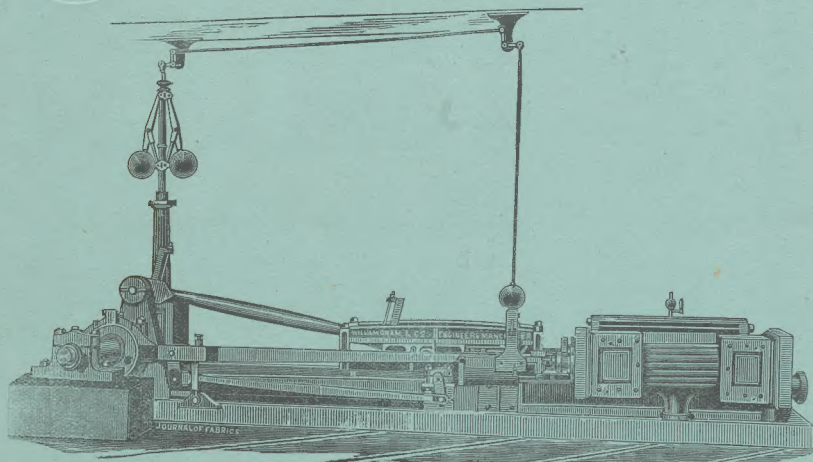
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The Textile Trades in 1887.

The Woollen Trade.

The expectations which were entertained at the beginning of the year that 1887 would see a revival in some of, if not in all, the industries of the great metropolis of the West Riding have been to some extent, at any rate, realised. Confidence has been in some degree restored, and a more healthy tone has prevailed in the various departments. Leeds, it should be remembered, does not depend for its commercial success upon any one particular industry, and, in that respect, the town holds an almost unique position in the country. Woollen manufacture is, of course, the principal trade, but, in addition to that, the town has now become one of the chief emporiums for the production of ready-made clothing in the country, and one of the largest workshops for the making of machinery and engineering tools, and for the hat and cap industries. At the opening of the year, the woollen trade was at a low ebb, the rise of prices in 1886 having only resulted in the accumulation of large stocks, which it took months and months to clear off. Owing to the fact that the English

manufacturers have had very little to do with the ruling of the markets, the relative prices of the raw material and of tops and yarns have borne no comparison with each other, the manufactured material being much cheaper than the makers had a right to expect. However, except in so far as regards the volume of trade, the woollen industry of Leeds has been fairly satisfactory during the year, but, although the turnover has been about an average one, profits have been small. The worsted coating trade has been large, but taste is now turning towards soft materials, in the production of which the Leeds mills are largely engaged. The home trade during 1887 has been middling. The French trade, owing to the unsettled state of politics, has not been satisfactory. The Australian trade has not come up to expectations, in consequence of the want of money on the part of the sheep farmers, but is now showing signs of improvement; the Canadian markets had become too glutted for any good to come of them in 1887, while the trade with America has been fairly well maintained. The prospect for the coming year is regarded as satisfactory, as prices are firmer now in London than they have been for some time past. Stocks are becoming reduced, and a more healthy state of trade is likely to prevail. Coming to the ready-made clothing trade, we find that the amount of business done during the year has been above the average, although profits, owing to competition, have been small. It has been chiefly a home trade, as foreign tariffs are practically prohibitive. The demand for worsted cloths has received a check, and there is now a demand for strong tweeds and fancy coatings. Naps and meltons have been largely used for winter wear, and also curl cloths for overcoats. Employment has been ample. In Huddersfield, larger quantities of all classes of goods have been produced during the year than ever before; but this must not be taken to indicate greater prosperity. On the contrary, as a fact, the profits of manufacturers and merchants have been cut down to a very low figure by the general depression in the country, and the consequent competition not only between our own traders, but between them and German and Belgian traders in England, our colonies, and foreign markets. As a result, it is said that in many cases the wages of men weavers have been reduced from 10 to 15 per cent. below the scale upon which the dispute leading to the strike and lock-out a few years ago was settled. This has been gradually accomplished by certain manufacturers keeping women weavers fully employed at the women's scale, which was lower than that of the men, and leaving men out of work for several weeks together, until they were compelled to accept work at the women's scale. In consequence of the rise in the prices of wools, trade was very good at the end of 1886; but merchants, thinking the rise would continue, overbought themselves, and manufacturers refused orders at the old prices. Consequently, there was a considerable falling off in the demand early in 1887. As the Jubilee celebrations approached and the weather became very hot and dry, there was a considerable revival in the home trade, especially for light goods and mantle cloths, and it was maintained for some time. After another lull, manufacturers, mainly of the cheaper kind of tweeds—and this indicates the effect of depression in other leading industries—became very busy, and many ran their machinery overtime, and some day and night, for a few weeks. General prosperity in the country would have caused a better demand in the home trade for better class goods, but these were largely bought for the countries where, under protection, the people could afford to buy them at prices enhanced by the tariffs. A few mills are being worked overtime still, and these are mainly where the lower tweeds and chevots are made. The demand in other branches has fallen off somewhat lately, and the prospects for the coming season are only moderately good. Worsteds coatings and trouserings form a very large proportion of the goods made in Huddersfield and the district. Coatings have consisted mostly of plain patterns in small twills, corkscrews, and a limited quantity of diagonals, in the proportion of about two-thirds black and one-third blue. There was a fair demand for trouserings, principally in neat stripes of black and white, and subdued colours. Several manufacturers had a fair sale of light drab, slate, and smoke coloured summer overcoatings. The repeat orders for the past spring and summer for fine worsteds were quite equal to expectations. For this winter, there has been a tolerably good demand for coatings and

trouserings, similar in style and colours to those for the spring trade, with a few small checks for trouserings; and dark drab, grey, and smoke-coloured overcoatings have sold very well. Very fine blacks have been in great demand for dress coatings, quite superseding the old black woollen cloths. Repeat orders for winter goods did not come in so freely as was anticipated. Tweeds have commanded a very large sale during the year, and have been made in a great variety of designs and in exceedingly artistic colours. Styles have increased in boldness during the year. This often results from the keenness of competition and low prices, cheapness causing an increased demand for novelties, and novelties in cloth invariably run in the direction of larger patterns and more pronounced and varied colourings. The demand has been about equal for plaids, checks, and stripes, but the stripes have been of a broken character, so that they could be worn for suitings as well as for trouserings. Checks, too, have been of an indefinite character, though bold. The smooth-faced tweeds which have for so long held the sway have given way very much to chevrons, and manufacturers of these goods have been very busy making them both for the home trade and for the American market. There has been a very large trade for all classes of mantle cloths, both for the home and export trades. The silk seals are made here with wonderfully beautiful appearance and of first rate quality, and the business in them has been a very profitable one. The curled cloths, especially in the finer qualities, have also been made in artistic colours and of much durability. It may be said that the trade of the heavy woollen district has been better than last year. It has been much better for the lighter classes of overcoatings and of ulsters. The heavy classes of goods have been quieter on the whole, such as pilots and witneys. There has been a good trade done in tweeds, and, during the last half year, a pretty good business has been done in trouserings. Ladies' mantle cloths and worsteds have enjoyed a good sale, and prices have been generally firm. Calls have been very frequent for coloured blankets, and just now there is a considerable business done in fulfilling Government contracts. The trade in whites has been about on the average, and in carpets, Kidders and Dutch have been very flat. Kensington squares have been on the average all through. There has been a good demand for Wiltons. Dyers have been pretty busy.

The Cotton Goods Trade.

During the past year, the two great branches of the cotton trade—spinning and weaving—have entirely changed their relative positions, so far as profit is concerned. For the first nine months of the year, spinners were working upon a very narrow margin, and nearly in all cases had an absolute loss upon their productions, whilst manufacturers of cotton goods, particularly for the Eastern markets, began the year with a fairly profitable margin, which has gradually disappeared, and become now so narrow as to leave absolute loss upon all those large transactions for India, China, and the markets further east. The advancing price in cotton was checked by a movement in favour of organised short time among the spinners, which effectually curtailed the operations of outside speculators for producing a corner in the autumn, and there is no doubt that, if raw cotton in the coming year is forced to a much higher price than that which now rules, a similar movement will be resorted to, but, this time, it will commence with the cotton manufacturers. The American crop, which is now being marketed, is proving a disappointment to the trade. With the enormous acreage under cultivation, it was expected that a crop considerably over 7,000,000 bales would establish a low rate of prices for the raw material. Judging by the late receipts at the ports, it seems that the out-turn will not be more than 6½ to 6¾ million bales, and, unfortunately, the cotton, having been grown during the very dry, hot season, is rather spongy in fibre, and results in more than the usual loss in working. The consequence is that really good cottons for good fabrics are likely to be relatively very scarce before the new crop is available. The outlook for the year 1888 indicates a very large increase in the output of the spindles, a considerable increase in the exportation of cotton yarns, and a diminution in the demand for cotton goods for the home trade, arising from the serious depression in agriculture and the mining industries. The demand for the Eastern

markets, which takes off over one-half of our entire exports for cotton fabrics, will largely depend upon the prospects of silver. If silver continue to improve, the exchanges between this country and India, China, and Japan, will also improve as a consequence, and we may then look for a considerable business, which will fully engage the looms of Lancashire. On the other hand, should the recent rise in silver only prove temporary, and any reaction take place, we may look for a very bad time indeed throughout the weaving districts of North-East Lancashire for both employers and employed. Whatever speculation exists in the cotton trade, at the present time, is entirely confined to efforts to manipulate the raw material. The recent rise in prices in Liverpool, of over 12 per cent., has not yet been responded to in the consuming markets by an advance of even 2½ per cent. all round upon textile fabrics. So there does not appear much hope that a further advance in cotton will be supported by the trade. On the contrary, it will be resisted in the spring by organised short-time working.

The Linen Trade.

Messrs. George Armitstead and Co., in their review of the flax and jute trades of Dundee, remark:—The linen trade has not shown any particular activity during any part of the year, but the demand has been about equal to the production; occasional periods of depression have been followed by increased activity, so that, on the whole, stocks have not accumulated to any extent. The exports are fairly well maintained, and, at present, manufacturers are well employed in almost all branches. At the best, however, this department of our trade has lost much of the vitality displayed in former years; other fabrics have apparently supplanted linen goods to a considerable extent, and those engaged in the trade have almost ceased to look for any material expansion in it. In the absence of any extension in the producing power, it seems more than likely that the trade may, with an improvement in other branches, prove rather better in the immediate future than for some time, and the prospect of cheap raw material rather lends encouragement to this view of the trade as at present situated. The jute trade stands in marked contrast: its main characteristic is the elasticity it displays, and the ever-increasing purposes to which jute fabrics are being adapted. The ebbs and flows in this branch are even more violent than in the other, but this is not surprising considering the enormous increase in the producing power in recent years: the wonder is rather that the increased production has been so steadily absorbed, and that while it has occasionally not resulted in much profit to the producer, the trade manifests a wonderful amount of vitality, and gives promise of still greater developments. At the present time, it is satisfactory to notice that almost all the spinning and weaving machinery in our district adapted for this trade is fully occupied, and the prospects must be looked upon as decidedly encouraging. It is also interesting to remark that the year under record is about the jubilee year of the jute trade; it is in 1838 we find jute first classified as an article of import, although it was in use for some little time previous to that. The importations of flax during the year have been on a liberal scale, and the quality, generally speaking, has been fairly satisfactory, compared to some preceding years; the quality of the flax imported from Russia having fallen off so greatly for some years past, it is some satisfaction to report that this year it has shown a little improvement. It may be that in some years the character of the season is not altogether favourable to the development of the plant, but, apart from this, it is only too well known that the fibre is now largely brought to the market in a very unprepared state; the scutching and cleaning is most imperfectly done, and the assorting or bracking is equally unsatisfactory. So much is this the case that a comparison of present prices with those ruling in former years is totally misleading; indeed, the present low range of prices must, in a large measure, be attributed to the great falling off in the quality: marks have no longer their old significance, and, as a natural consequence, consumers buy largely from sample. As has been indicated, the flax imported this year has been, on the whole, fairly good, particularly that from the Peterburgh districts, where a large and good crop was reaped. The preparation of the flax was also satisfactorily done, owing, no doubt, largely to a good retting season, and shippers

and spinners alike had mutual advantage from it. The Archangel flax, of which the importation has been very small, left much to be desired, and the so-called "Government brack" has entirely ceased to command the confidence it formerly enjoyed. At Pernau, the assorting of the flax is still, on the whole, carefully attended to, although the cleaning leaves much to be desired. The flax imported from Riga has been very varied in character—some was satisfactory, much quite the reverse; the bracking continues to be very irregular, and the tendency is to run the flax into the higher marks without any due regard to quality. The fluctuations in prices during the year have been very slight. The opening prices for the new crop were at a very moderate range, and there was very little rise or fall in the early part of the year; subsequently, prices gradually declined, owing to the fall in the Russian exchange, and to the extremely dull state of Continental trade, and also because supplies continued larger than was expected.

Taken as whole, the trades of Barnsley generally have experienced a year in which a fair amount has been done, but prices have ruled low, and profits have reached the smallest possible point. In every department of the miscellaneous trades of the town, the same state of things exists, and there appears to be little complaint beyond the general one of small profits, and a great amount of work having to be done for the money. Generally, workpeople have been fairly employed. Whilst so much is heard of the unemployed, there is nothing shown by the statistics that many people are out of employment in Barnsley. The returns show that the amounts paid in parish relief to outdoor paupers is fully 10 per cent. less than at the same period of last year, whilst the number in the workhouse has also decreased. The linen manufacture of the town has had, throughout, a quiet year. The trade continued fairly steady during the first four or five months of the year, when a period of quietness ensued until after the Jubilee celebration. During the latter part of the year, the trade has been of a moderate character. In the best class of goods, drills, and other specialities, trade has been fairly well maintained, and as the year closed the demand was fairly active. Damasks have had a very quiet year. On the whole, the old Barnsley linens have met with but little sale. Makers who have met the taste of the time by producing lighter, cheaper, and more showy goods, have experienced a somewhat better time. There has been almost constantly, throughout the year, a steady demand for sheetings and towellings, and in the lower class of goods generally, prices have all round been low, and profits correspondingly small.

The Lace Trade.

The expectations formed at the beginning of the present year of a general revival in the lace trade have not been fulfilled. The labour difficulty caused a good deal of trouble in the opening weeks of 1887, whilst the approach of Easter did not exercise its usual stimulating effect upon the market. A cold spring intervening between Easter and Whitsuntide continued the depression, and the few special novelties which had been produced were not disposed of, whilst the production of others was necessarily discouraged. No real buoyancy has been experienced in any branch of the trade, for even after the commencement of summer weather in June, sales continued below the average for the season, and, according to the latest accessible official figures, the falling off for the year has been very marked. Silk laces have, it is true, shown a slight improvement, but the demand is precarious, the production of Chantilly and silk Spanish goods being more profitable to Calais than to Nottingham manufacturers. In bobbin nets, less business has been done than in the previous year, owing to the falling off in the sale of Swiss embroidered laces, though this has not, on the other hand, materially improved the market for English millinery goods. The curtain and window-blind trade has been tolerably active, and the output has probably been exceptionally large, but this is discounted by the serious falling off in prices, caused by the severe competition of non-unionists centres with the highly paid labour of Nottingham hands. The ruching, frilling, and made-up department is in a very unsatisfactory condition, and, for the present, there is no prospect of material improvement in any branch of trade.

Exports of Manufactured Articles from the principal European Countries.

M. Arthur Raffalovich, writing in the *Journal de la Société de Statistique de Paris* reproduces a series of tables which have been compiled by the Austrian Industrial Association, showing the exports of various manufactured articles from the principal European countries—Austria, Germany, France, Great Britain, and Belgium—during the years comprised between 1881 and 1885 inclusive. The following are the tables from 1882 to 1885 inclusive. The figures in the first column of each year representing millions of francs:—

	1882.		1883.		1884.		1885.	
	Francs.	Per cent.	Francs.	Per cent.	Francs.	Per cent.	Francs.	Per cent.
COTTON YARN.								
Austria -	2'2	0'4	2'5	0'6	2'2	0'5	2'2	0'5
Germany -	40'2	9'2	32'0	7'1	28'2	6'2	23'0	5'8
France -	2'7	0'7	2'2	0'5	2'2	0'5	3'2	0'9
Great Britain -	385'7	88'3	405'0	90'2	416'5	91'2	355'7	91'7
Belgium -	6'0	1'4	6'7	1'6	6'5	1'6	4'5	1'1
	436'6	100'0	448'4	100'0	455'6	100'0	388'6	100'0
WOOLLEN YARN.								
Austria -	10'2	4'5	9'2	3'9	9'7	3'8	8'5	3'2
Germany -	42'5	18'5	38'5	16'3	40'2	15'9	45'2	17'0
France -	34'2	14'9	35'7	14'6	32'2	12'7	35'5	13'3
Great Britain -	101'7	44'3	97'7	41'4	116'7	46'5	126'5	49'1
Belgium -	40'1	17'8	55'2	23'8	53'2	21'1	46'7	17'4
	228'7	100'0	236'3	100'0	252'0	100'0	266'4	100'0
LINEN YARN.								
Austria -	18'7	16'8	18'0	15'2	19'7	14'5	24'2	16'0
Germany -	5'0	4'5	4'7	4'0	4'5	3'3	3'7	2'6
France -	4'5	3'9	4'2	3'6	5'3	4'1	8'7	5'8
Great Britain -	31'0	27'8	31'5	26'7	34'0	25'0	29'2	19'5
Belgium -	52'5	47'0	59'5	50'5	72'2	53'1	84'7	56'1
	111'7	100'0	117'9	100'0	135'9	100'0	150'5	100'0
COTTON TISSUES.								
Austria -	16'2	0'8	20'5	0'9	18'0	0'8	17'0	0'9
Germany -	183'8	8'4	180'7	8'2	192'5	9'2	188'2	9'5
France -	97'7	4'4	89'6	4'4	89'2	4'6	102'2	5'2
Great Britain -	1888'5	85'4	1887'2	85'6	1766'7	84'4	1652'0	83'6
Belgium -	23'0	1'0	21'0	0'9	21'2	1'0	16'7	0'8
	2209'2	100'0	2199'0	100'0	2087'6	100'0	1976'1	100'0
WOOLLEN TISSUES.								
Austria -	62'2	4'5	54'5	1'1	55'2	4'0	45'5	3'6
Germany -	275'5	20'7	275'7	21'1	285'0	21'3	247'2	19'8
France -	402'0	30'1	370'0	28'4	341'5	24'8	330'5	26'4
Great Britain -	562'2	42'0	576'5	44'3	618'0	47'7	590'5	47'9
Belgium -	30'2	2'7	25'2	2'1	26'5	2'2	28'5	2'3
	1332'1	100'0	1301'9	100'0	1347'2	100'0	1251'2	100'0
LINEN CLOTH.								
Austria -	18'5	7'2	11'7	4'9	10'7	4'7	8'0	3'7
Germany -	21'5	8'1	20'7	8'9	19'5	10'0	24'0	10'9
France -	22'5	8'7	19'7	8'4	14'5	6'3	13'0	5'9
Great Britain -	178'5	68'8	162'5	68'9	154'7	68'1	148'2	67'6
Belgium -	20'7	8'0	20'7	8'9	23'0	10'9	26'2	11'9
	261'7	100'0	235'3	100'0	225'4	100'0	219'4	100'0
SILK GOODS.								
Austria -	8'5	1'5	9'5	1'6	9'7	1'8	8'7	1'9
Germany -	208'2	35'6	195'0	33'6	207'0	39'9	178'0	38'0
France -	289'5	49'3	301'2	52'0	236'7	45'6	221'7	47'3
Great Britain -	80'0	13'6	71'7	12'8	64'2	12'7	57'5	12'3
Belgium -	0'2	—	0'7	—	0'2	—	2'2	0'5
	586'4	100'0	578'1	100'0	517'8	100'0	468'1	100'0

If we examine the results of these tables, we see that, as regards cotton yarn, England has not only maintained her superiority, but her exports represent 91 per cent. of the total exportation in 1884-85, in place of 88 per cent. in 1882, whilst Germany has seceded from 9'2 to 5'8 per cent. France and Austria have made a little progress. With respect to cotton

tissues, the table shows widely different results. England's share has fallen from 85.4 to 83.6, Belgium from 1 to 0.8; the proportion of Germany has increased from 8.4 to 9.5 per cent., and that of France from 4.4 to 5.2. It would appear that whilst England has maintained her position for *spinning*, she has lost ground in *weaving*. Woollen yarn indicates the advance of England from 44.3 per cent. to 49.1, at the expense of Belgium (17.8 to 17.4), of France, Austria, and Germany. In tissues of wool, England has advanced, whilst Germany contributes no more than 19.8 in the place of 20.7 per cent., and France recedes from 30.1 to 26.4. For linen yarn, Belgium occupies and keeps the premier position; for linen cloth, Germany and Belgium have gained ground, while France and England have lost it. For silk goods, France has receded from 49.3 to 47 per cent.; Germany has increased from 35.6 to 38 per cent., and England has lost ground.

Industrial and Commercial Museum in Lisbon.

The following is a report, dated the 29th October last, by Mr. G. Brackenbury, Her Majesty's Consul at Lisbon, upon the Industrial and Commercial Museum recently opened in that city:—"An industrial and commercial museum was opened this summer at Belem, a suburb of Lisbon. In the year 1885, circulars were addressed to the Portuguese Consular body in the United Kingdom, as well as in other countries, soliciting their co-operation in obtaining samples of raw materials and finished products from those countries for exhibition in the museum. The regulations had further provided that the directors of the museum should apply directly to foreign manufacturers and associations for similar help; but, on inquiry, I find that this latter course was not adopted. The members of the Portuguese Consular body would appear to have treated this circular very differently in different localities. In some, for reasons which I have no means of appreciating, they either did not act upon it or they encountered such obstacles as rendered their action ineffectual. Such was notably the case as regards the United Kingdom, which found itself practically unrepresented at the opening of the museum. On the other hand, the Portuguese Consul at Budapest forwarded a very remarkable collection of objects illustrating, with considerable fulness, the natural products as well as the manufactures of the Kingdom of Hungary, a collection which occupies nearly, if not quite, half the space at present allotted to foreign exhibits. The whole space as yet available for the museum consists of two long well-lighted rooms, perhaps 250 feet long by 30 feet wide. Half, more or less, of each room is assigned to Portuguese, and half to foreign exhibits. Among the exhibits will be found silk, cotton, wool, flax, and hemp, in every stage, from the growing plant or raw material to the most highly finished products of the loom. Most of the principal manufacturers of the world are here represented, as well as many natural products, and if the scheme be thoroughly carried out, there can be little doubt that the museum will not only afford an excellent means of technical instruction for Portuguese producers, manufacturers, and artisans, but might become a valuable means of making known to the Portuguese public, and thus opening a market for, many products of British industry which are at present unknown here. Against these desirable results two obstacles contend. The first, a permanent one, is the distance of the Museum (at least four miles) from the centre of Lisbon. The second obstacle, which will probably disappear with time, but cannot do so in the immediate future, is the extremely limited space available for exhibitors. While, therefore, I have considered it to be my duty to report, for the information of the industrial and commercial interests in the United Kingdom, the existence of this museum, I should not, under existing arrangements, feel justified in recommending private firms or individuals to send goods for exhibition as yet. I would rather suggest that collections, illustrating the British industry of different centres of production, might with advantage be made by the respective Chambers of Commerce, and forwarded to Lisbon. Should, however, any private firms desire to forward goods for exhibition, I would advise them to place themselves, previously, in communication with the courteous and obliging conservator of the museum, who would inform them how far the amount of space at his disposal would admit of his acceding to

their wishes. He has kindly furnished me with printed copies, which accompany this report, of the circular intended to be forwarded by the Portuguese Consuls in the United Kingdom to persons or corporations likely to exhibit, as well as of the regulations in force as to the management of the museum. Both regulations are drawn up in English. I may remark, in these papers are referred to, that neither the periodical report, nor the reference to them, has yet been published. I should also mention that, as I am informed by the conservator, a regulation, according to which any manufactured article not withdrawn within six months after its arrival is to become the property of the museum, is to be rescinded, and the exhibitor will at all times have the option of selling or of withdrawing the exhibit on receiving notice to that effect. Exhibitors must pay freight and all charges to Lisbon, but will not be liable for duties or any charges for carriage or installation when once the goods have reached Lisbon. The purchaser, however, of articles exhibited will be required, before removing them from the museum, to pay the duties to which they are liable. All communications and consignments of goods should be addressed clearly as under:—Ilmo Exmo Snr, Conservador do Museu, Industrial e Commercial, Casa Pia, Belem, Lisboa.

Commercial Examinations.

The Council of the Society of Arts have had for some little time under consideration the question of modifying or enlarging the system of commercial examinations, which have now for many years been carried on by the society, in view of the recent demand for improved commercial education. The experiment of holding examinations simultaneously at local centres was first tried by the society in 1856, and the principle has since developed into the examinations of the Science and Art Department, the Oxford and Cambridge locals, &c. During the 30 years that these examinations have been carried on, the system has undergone various modifications. At present, examinations are held in subjects covering pretty much the same ground as that defined in the new scheme of the Oxford and Cambridge Local Examinations; but certificates are awarded in single subjects, not on the general result of the examination. For some years, the experiment of awarding general commercial certificates, instead of the separate certificates, was tried, but was found less satisfactory to the candidates generally. Before deciding on any course of action, the council have submitted a draft scheme to the examination boards in union with the Society of Arts, and are awaiting the result of their enquiries before making any public announcement. In any event, it is not likely that the system of separate certificates will be abandoned, though it is not improbable that it may be supplemented by the issue of general commercial certificates, either on the result of the present examinations, or of examinations to be specially held. The society have already received a promise of £100 for a travelling scholarship from the Clothworkers' Company, and it is hoped that further assistance may be received of the same kind. The object of these travelling scholarships is, of course, to enable the holder to acquire that practical knowledge of foreign countries, which can only be attained by actual residence abroad.

The Roving Frame.

A lecture was given a few days ago by Mr. Taylor, head of the carding department of Messrs. Asa Lees and Co., Oldham, on the "Roving Frame." The lecturer said:—"Before entering into the description of the roving frame, I thought I might profitably speak a little on the flat carding engine, and also just take a glance into the past history of the cotton trade in this country. We are told that India was the birthplace of the cotton manufacture, and that for centuries the craft travelled but slowly to the western countries of Europe, and that few or no changes were introduced in the mode of spinning and weaving until the age of invention in England. Until about the year 1760, the machines used for the manufacture of cotton fabrics were of the rudest construction, spinning and weaving were, as a rule, carried on in the cottage, and the machines used at that time were little different from the primitive wheels and looms in use in India. The introduction of the manufacture of cotton fabrics into England gave a strong impetus to the demand for cotton goods, and, no doubt, the beautiful fabrics imported from India proved a great incentive to inventors. This country has gained much by the misfortunes and intolerance of governments in other countries, whose people, being expelled from their native countries, took refuge in England, and brought with them the trades and knowledge of

manufactures. England owes much to the memory of our early inventors, such as Lewis Paul, John Wyatt, Sir R. Arkwright, S. Crompton, and R. Roberts. These men struggled hard, and worked for a time amidst persecution and poverty, laying the foundation of a vast industry and wealth; and we have for a long time taken the advantage of our position and kept to the front. But now great changes have taken place in the textile industries. Neighbouring nations look with envy on our prosperity and industry, and have been striving for some time past to meet us in, what we consider, our own markets abroad. Competition is something more than it was in the early history of the cotton trade in this country. Our competitors have the same machinery and appliances as we, besides working longer hours. And if we are to hold the position we have held in the past as manufacturers for the world, more attention will have to be paid to the theoretical, as well as to the practical, knowledge of our industries by the workpeople. The day of rule of thumb is past, theoretical knowledge has been applied to the industries, and created them sciences. Rules are now laid down for the spinning and manufacturing of cotton, that when worked and calculated enable us to prophesy results. As in the manufacture of steel and other industries, science has increased the production more than four-fold, at much less cost, and, when applied to the textile manufactures, enables us to get greater production,—cheaper, and at less risk and toil to the workman. Our competitors have been before us in establishing technical schools for the education of artisans; but now this country is taking the right course. Schools for the study of spinning, weaving, dyeing, &c., are being promoted and encouraged in different parts of the country, and, I think, we need not fear if we only take advantage of the natural resources peculiar to this country for the manufacture of textile fabrics. The process from the raw cotton to the finished thread is very varied and numerous. In the mill, the first process is the mixing of the cotton according to the quality of the yarn required. It then goes through the first machine called the opener, which loosens the fibres and cleanses the cotton from sand and other impurities. A very good system of opener for low and medium cotton is the one styled *Crighton Opener*, with the beater standing vertical, running about 600 revolutions per minute. The cotton is drawn in by means of a draft from the fan at the bottom of the beater, between the grid base, and gradually works its way out at the top of the beater, being opened all the time until escaping at the outlet at the top of the beater. Openers are sometimes made to form a lap ready to be put upon the first scutcher. If the opener does not make a lap, the cotton on leaving the opener is weighed and spread evenly on the lattice of the scutcher, and formed into a lap. The scutcher again opens and cleans the cotton, as well as loosens the fibres, and spreads them out ready for the cards. Single lap machines are now more in use than double machines, so as to get more doubling and even laps. For spinning medium counts, three single machines are generally used, with the regulator on the last, or finisher, machine. The regulator is so arranged as to make every finished lap as near the same weight as possible. The regulator is worked by means of cone drums, so that, if more cotton is going in at the feed rollers than is necessary, the cone pulleys alter the speed of the feed rollers, that the lap may be finished the proper weight. The necessity of keeping these finished laps as equal in weight in every part as possible will be seen, when one yard of lap is sometimes drawn out to the length of 26,880 yards. The next process is the carding of the cotton. The lap being put up at the card is drawn in by the feed rollers, and carried on to the cylinder by the taker in; this is a roller covered by sharp teeth in the form of the saw tooth. The object of this roller is to break up the lap, and to take away the shell and dirt that have escaped the opener and lap machines. The cotton in passing through the card is drawn out, all the fibres being laid straight, and passes from the doffer in form of a fine web to the coiler. Good carding is the foundation of good spinning, and if work be spoiled in the card department, it is not possible to make it right in the other machines which follow. Roller and clearer cards, single and double, have been most in use for medium counts until a few years ago, but, at the present time, the flat card seems to be running the roller card out of the market, both for low and medium counts. At this point, we might just notice the working and mechanism of the revolving flat card. The lap is placed in the usual way on the card, and passes underneath a feed roller, which is pressed upon a hollow plate. This style of feeder is much better than two feed rollers, as the taker-in can be set much closer to the nip of the roller, and the motes and shell are much better taken out. The cotton is then passed from the taker-in on to the cylinder, and carried between the top flats to the doffer, from which the cotton is combed off in the form of a fine web, and passed into the coiler in the form of a band or sliver. The great improvements in the manufacture of the wire clothing, and those that have been introduced in the details of the machine, have enabled the flat card to compete more successfully, increasing the production, and at the same time greatly reducing the labour of stripping and grinding. It is a machine that requires the most careful attention to detail in making. The top flats should be most accurately tested, so that, when set down to the cylinder, every flat will be equally distant from the wire on the cylinder. Casing plates, back and front, should be as close-fitting as possible to prevent any accumulation of fly and dirt. Another important point in these cards is the mode of adjusting the flats to the cylinder. This matter has occupied the attention of machine makers for some time. In one design, a flexible bend works on a fixing set eccentric with the centre, and as the top taper flexible is moved, it raises or lowers the flats on the cylinder. Another style is that in which a flexible bend rests upon five inclines, and as the bend is moved backwards or forwards, the flats are set down. In a third variety, a flexible bend rests upon a conical ring; the ring is moved in by means of screws, and raises or lowers the flats as desired. A fourth style is a rigid bend, with a number of steel bands or ribbons packed on to form the path of the flats. These bands are made of varied thicknesses, and, as the wire is ground down, one of the thin steels is taken out to lower the flats. Now, when a card has been ground and requires re-setting, it is scarcely possible

to measure how much the wire has been ground down, so in taking out one of the steel strips, if it be too much or too little, the difference has to be made by moving the centre of the cylinder by means of a screw under the pedestal. The moment the cylinder is moved, it ceases to be concentric with the flats, and will be nearer at the sides than at the top. In another design, there is an ordinary flexible bend upon which the flats travel. In this card there are five setting places, and the flat can be adjusted at any of the five setting places separately. Originally, this bend had only three adjustments, and when the weight of the flats came upon the bend, it caused a slight deflection between the setting places, but, since the introduction of two more adjustments, the bend can be set with the utmost nicety. The advantages of this style of bend over the others we have noticed are that it can be set to follow the side wear of the cylinder, which always takes place, owing to the forward movement of the cylinder and the pull of the strap. The flats can be set a little further off the cylinder, on the side of the entrance of the cotton, and can gradually be set closer as the cotton is being carded, and, passing towards the doffer, its arrangement for setting is simple. The other systems of cards require a moveable centre to compensate for the side wear of the cylinder shaft. This is not desirable, as, when the centre is once moved, it is very difficult to again be made right. There are various modes of setting flat cards, the one by guage and ear, and another by indication and electricity. An indicator is all very well as a guide, but cannot be entirely depended upon. Setting by electricity seems very good, but I think no one would attempt to set a card to work after it had been set by electricity, unless first easing the flats a little off the cylinder, and I have come to the conclusion that there is no truer mode of setting a card than the touch and the ear. We now come to the slubbing, intermediate, and roving frames, machines all of similar construction and mechanism. These machines are used to draw out the sliver into a fine roving, ready for the spinning mule, or throstle. The construction of these machines is more durable, and the motions act finer and more tender than the earlier flyer frames. There are many motions in the roving frame of great importance, and they are necessarily of accurate construction. In one made by Messrs. Asa Lees and Co., strict attention is paid to every detail in construction. The cone drums are of large diameters, and run at high speeds, enabling the frames to work with the least possible twist. The winding motion is a very important part of a frame, for, when the winding is irregular, extra twist is sometimes put in to keep up the ends, thus curtailing production, while at the same time spoiling the work. Jack box, or differential motion, is geared direct from the cone drum shaft, reducing back lash as much as possible. It is worked with internal bevels, and all parts are well lubricated and made so as to work with economy. We are now making frames with this style of jack box, driving 100 slubbing, 144 intermediate, and 200 roving spindles. The twist is a very important matter in roving frames, and no more twist ought to be put in than will enable the roving to drag the bobbin in the creel safely. This frame is arranged with a compound twist carrier wheel, so that large change wheels are required, viz., a 41 twist wheel geared into the compound wheel will only put the same twist in as a 24 when geared single carrier, so that in changing the twist a fine change can be made. Connected with this machine was a patent cone releasing motion. This was in connection with the patent knocking-off motion. When the bobbin became of full size, the frame was stopped, and, just before the flyers cease to run the cone drum is lifted, and the momentum given to the flyers just delivers as much roving as the tenter needs to wind on to the empty bobbin to begin afresh. A patent knock-off motion was so arranged that it could be set to stop the frame at any part of the lift. Knock-off motions generally stopped the frame just on the change, but, in this case, it could be set at any part of the lift. Another important part was the tapering motion, which was in connection with the change motion, or, as it was called sometimes, the "box of tricks." It was necessary that the under bar, or slide, bar should be exactly level, or irregular bobbins was the result. Bobbins were sometimes more taper at one end than at the other, and that was because the anchor bar had not a horizontal motion. This was an important matter, for there was nothing looked worse than to see bobbins in an acute angle at one end and at a taper at the other. There was less weight put on, and it caused great waste through the roving running off. As to the reversing motion, there should be as few wheels in it as possible, so as to prevent dwelling at the change. If they had got a great many wheels, when the motion was reversed, the back-lash had to be taken up, therefore, a few wheels were better. Another important point in the roving frame was that of bobbin or flyer lead. There had been a great deal of discussion as to which was the better. Theoretically, the bobbins' lead was the better, for though it was rather heavier to drive, it caused less ratching. With flyer lead, the flyer started before the bobbin, and it meant a stretching of the roving to the extent that the flyer gained; while if the bobbin led, it started winding at once. There had been a great deal of discussion as to whether the bobbin increased or decreased in speed when the bobbin led. When the bobbin was leading, the larger it got in diameter, the slower it went, but when the flyer led, the opposite was the case. This seemed impossible, as the roller was delivering just the same quantity in roving, but it was because of the difference in speed between the bobbin and flyer. Another question was which was the better, the single or the double presser. No doubt, the double presser was the better, but it was found in practice that there were greater repairs in frames with double pressers than with single ones. It was not possible for a flyer to fall without being damaged. If one presser was broken, the frame could still work, and the tenter would continue to run it with one presser off, the result being that the spindle was more out of balance than if there was a single presser. The lengths of lift were in slubbing frames 10 to 12, intermediates 8 to 11, and roving frames 5 to 8. There used to be a great many frames with soft bobbins, but there were a great many working up to 20 hank rovings with pressers. No doubt, soft bobbins made a rather better roving than pressers, but in rovings up to 12 or 14 or 16 hanks, the difference was scarcely perceptible. Double pressers, he explained, made no difference in the roving; it was only a question of which was the better theoretically.



ORIGINAL DESIGNS.

On our first plate, we give a design for a Toilet Cover, which we have no doubt will be of service to manufacturers of cotton goods, as it is equally adaptable as a Quilt.

On our second, we give a rough sketch for a Tapestry Carpet, which, in a suitable colouring, should make a good bedroom or stair carpet. This has been designed by Mr. F. Layton, York Terrace, Akroydon, Halifax.

On our third plate, we give a design for Muslin for curtain purposes.

MONTHLY TRADE REPORTS.

Wool.—This branch of trade has, during the past month, been firm and strong, and although, towards the close, the demand fell off, it was owing to the approach of stock taking. Prices, especially for English wools of good staple, have ruled dearer, and may be quoted $\frac{1}{4}$ d. to $\frac{1}{2}$ d. per lb. higher than a month ago. Yarns have met with much inquiry, and spinners generally have advanced prices, and they express confidence in a prosperous trade during the early months of 1888. The piece branches, although the demand has not been much better, are cheerful as to the early future, and are in hopes of running full time on fair prices.

Cotton.—The markets for the raw material, especially taking into consideration that in December there is generally a falling off in demand, have ruled firm, and a large volume of cotton has been sold at hardening rates. Spinners of various kinds of yarns have had an exceptionally good month, prices being much in their favour, and the month closed with an upward tendency for most descriptions. They are looking forward to a good and remunerative trade for the next three months. On the other hand, manufacturers of cotton goods find it a matter of much difficulty to make their fabrics with a margin of profit, taking into account the rates now being paid by them for yarns, and although there is a tendency to refuse orders unless a distinct advance in prices is given by merchants, still, to keep machinery employed, low prices have often been taken. Manufacturers generally regard the immediate future cheerlessly.

Woollen.—For the last month of the year, there has been a fairly good business doing, but, stock taking being the rule, the markets have only been thinly attended. During the past year, in nearly all departments of the woollen industry, an average business has been done at fair prices, and the prospects for 1888 are cheerful. In cloths for the ready-made clothing trade, rapid strides have recently been made, and numerous orders have been given out which will keep manufacturers of this class of fabrics fully employed for some time to come. For next winter's trade, some effective patterns have been produced, and have met with fairly good orders from merchants. The better class of worsteds still meet with much favour.

Linen.—There has been a falling off in the production of linen goods, as, of late, stocks have accumulated. Fancy table, and other, damasks have had but a meagre demand at low prices. Fine fancy and common drills have sold fairly well, as have towellings of various kinds, and other domestic cloths. There has been a moderate call for sheetings and huckabacks. Hand-made linens have been quiet.

Lace.—This branch of industry finished the year as it began, in a dull fashion. The demand for most classes of goods has been of a very quiet character, and the outlook generally for

1888 is anything but cheerful. Keen competition, and low and mostly unremunerative rates characterised the trade during the greater part of last year, and although manufacturers, by various expedients, have tried to raise the tone of the markets, both as regards demand and prices, their efforts have generally failed. This has been especially the case in the Nottingham centre. In the Ayrshire districts, a better state of things has prevailed, and a more hopeful view of the lace trade generally is taken.

The French Permanent Colonial Exhibition.

The French Permanent Colonial Exhibition has received recently a sample of cotton forwarded by M. Pierre, the Government cultivation agent at Libreville, on the Gaboon, and also a sample of cotton forwarded by the Gaboon Catholic Mission. These have been submitted to the Paris Chamber of Commerce and the Conservatoire des Arts et Métiers. The former body report that the sample obtained by the Government agent is of superior quality, and therefore extremely interesting. The fibre is very long, and may be compared with that of Georgia long and fine staple, Fiji, and Sea Island cotton. It is added that, with it, French spinners will be enabled to compete with the English producers of very fine counts. It is valued at 150f per 50 kilos. (say about 14d. per lb.), and it is added that it would meet with an easy sale. The second sample is a shorter staple, but rivals in interest the first named. It resembles ordinary American or Brazilian cotton, though, perhaps, a little coarser. It is said to be worth about 65f. per 50 kilos. (say about 6d. per lb.), and the reports suggests that it would sell more readily than the finer and longer staple, as its use would be more general. The values quoted are, of course, for the cotton delivered at Havre. In conclusion, the Chamber strongly recommends the cultivation of both descriptions of cotton as being likely to yield highly satisfactory results. The report from the Conservatoire states that the shorter stapled variety is comparable to the superior kinds of Indian cotton—being indeed slightly better than those descriptions,—and estimates its value at 55f. per 50 kilos. (say about 5 $\frac{1}{4}$ d. per lb.), delivered in France. The finer description is compared, in this report also, to Sea Island and to the longer and finer American staples, and its value is estimated at from 150f. to 200f. per 50 kilos. (say 14d. to 18 $\frac{1}{4}$ d. per lb.), delivered in France. It is pointed out that the vast area of cultivable land, possessed by France on the Gaboon, offers scope for a very considerable development of cotton cultivation. The administration of Gaboon has been officially instructed to encourage cotton planting, and to supply seed to all who are willing to engage in it. A hope is expressed also that the Catholic Mission will likewise promote cotton production.

Board of Trade Returns.

Certainly trade is improving. The fact is writ very large on the Board of Trade returns for the past year, although it is accompanied by circumstances which detract considerably from the favourable aspect of the whole. The total value of our exports during the year was upwards of 221 millions sterling, showing an advance of nearly 9 millions sterling in 1886. But then the imports amounted to 362 millions, showing the enormous excess of 141 millions sterling in imports over exports, and an increase of more than 12 millions sterling when compared with the previous year. On the other hand, it must be noted as a more promising feature that for the month of December the increase of exports exceeded that of imports. We paid a million less for raw materials, and sent away textile goods worth upwards of a million and a-half more than the corresponding exports in the previous December. There was a similarly gratifying increase in the exports of machinery and manufactured metal goods. Most significant of all, according to a well-known dictum of the late Lord Beaconsfield, a great improvement is noted in the chemical trade. That depends for its prosperity on such a variety of industries that its recent marked advance may be regarded with confidence as a most excellent augury for the prosperity of English manufactures during the present year.

The Comte d'Oultremont, the Commissioner of the Belgian Government attached to the International Exhibition of 1888, has requested Mr. James F. Hutton, the Belgian Consul in Manchester, to inform the public that the latest dates for receiving applications from exhibitors for space, &c., will be the 15th January from countries in Europe, and 1st February from more distant countries.



London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1878.



Philadelphia, 1876.



Dublin, 1885.



Leeds, 1875.



HEATS THE FEED WATER WITH THE WASTE HEAT TO A TEMPERATURE
CONSIDERABLY ABOVE BOILING.

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every description of Boiler for upwards of 35 years.

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THESE ECONOMISERS ARE NOW CONSTRUCTED FOR EXTREME HIGH PRESSURES.

PROVISION MADE AGAINST INCRUSTATION AND MUDDY WATER.

1887. New Patents. 1887.

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and superiority of design.

Original Inventors, Patentees, and Sole Makers,

EDWARD GREEN & SON,

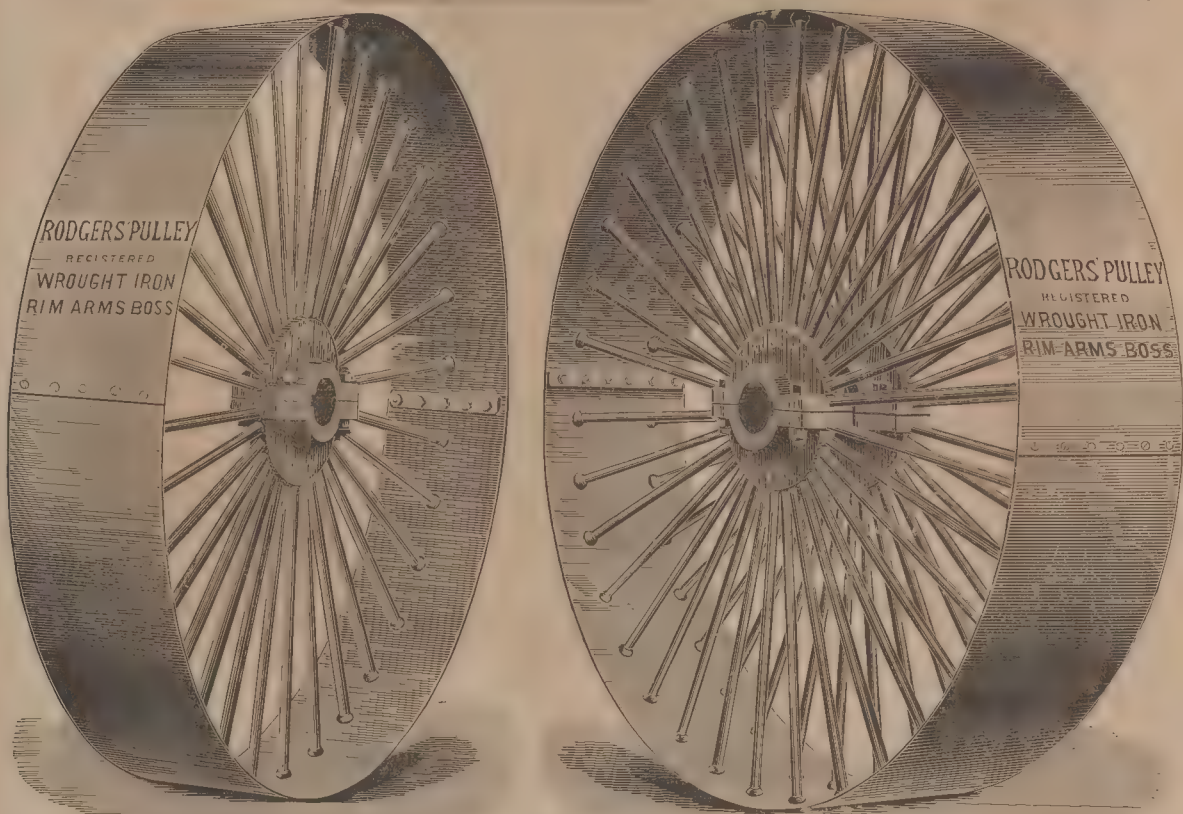
ST. ANN'S SQUARE, MANCHESTER.

WORKS:—WAKEFIELD, YORKSHIRE.

January 12th, 1888.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

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SPLIT OR SOLID. ALL SIZES FROM 6 INCHES UP TO 24 FEET DIAMETER.

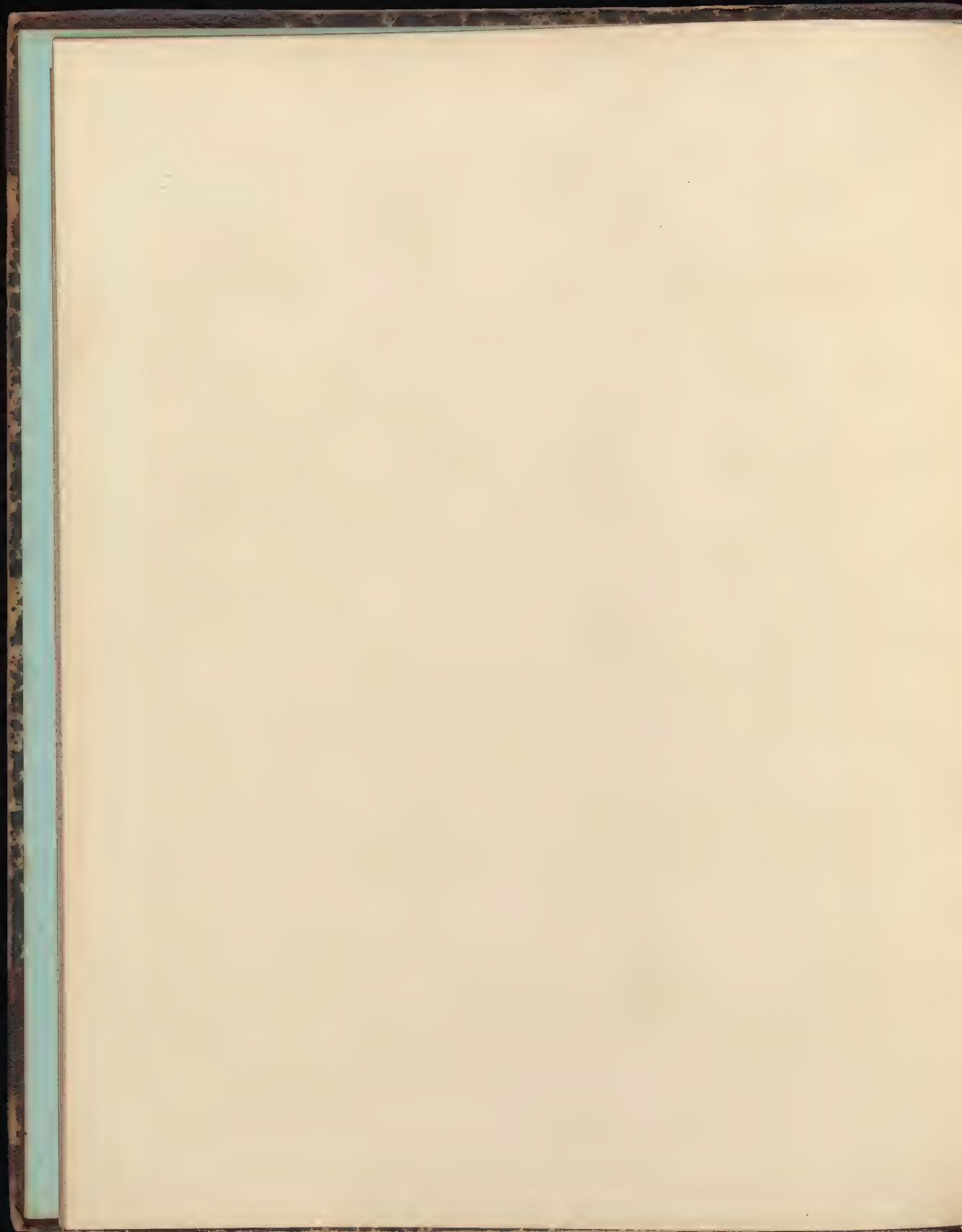
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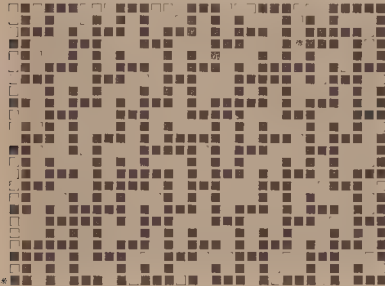






Worsted Trousering.

No. 505.



Design.

Draft:—

1 end face.
1 „ back.

Backing Warp:—

24 ends Black worsted 2/48's,
1 end Steel worsted 2/48's, } 4 times.
1 „ Black worsted 2/48's,

Face warp:—

24 ends Black worsted 2/60's.
8 „ Black worsted 1/60's,
twisted to Lavender
silk 1/90's.

Woven:—

1 pick Black worsted 2/60's
1 „ Black woollen 10
skeins.
1 „ Black worsted 2/60's.

3,584 ends in face warp; 3,584 ends in backing warp; 112 ends per inch; 84 picks per inch; 32 healds; 14's slay; 8 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. Finish clear and smart. Weight 24 ozs.

Woollen and Mohair Coating.

No. 506.

Warp:—

1 end Blue woollen 2/28's
1 „ Black mohair 2/24's worsted } 4 times
1 „ Blue woollen 2/26's
2 ends Black mohair 2/24's hard twist.
1 end Blue woollen 2/28's.
1 „ Black mohair 2/24's.
2 ends Blue woollen 2/28's.
1 end Black mohair 2/24's.
2 ends Black woollen 1/28's, twisted to
Crimson 1/30's.

Design

1 end Black mohair 2/24's.
2 ends Blue woollen 2/28's.
1 end Black mohair 2/24's.
1 „ Blue woollen 2/28's.

Straight Draft.

Pegged to fall.

Woven:—

1 pick Blue woollen 1/14's.
1 „ Black mohair, as warp. } 5 times.
1 „ Blue woollen 1/14's.
2 picks Black mohair 2/24's hard twist.
1 pick Blue woollen 1/14's
1 „ Black mohair, as warp. } Twice.
1 „ Blue woollen 1/14's.
1 „ Black and Crimson, as warp. }
1 „ Black mohair, as warp. } Once.
1 „ Black and Crimson, as warp. }
1 „ Blue woollen 1/14's
1 „ Black mohair, as warp. } Twice.
1 „ Blue woollen 1/14's.

2648 ends in warp; 42 ends per inch; 46 picks per inch; 14 healds; 15's slay; 3, 3, 3, 3, 2 ends in reed; 63 inches wide in the loom; 56 inches wide when finished. Finish clear and smart. Weight 22 ozs.

Woollen Suiting.

No. 507.



Design

Warp:—

6 ends Black, 2/24's woollen.
6 „ White, 2/24's woollen.
5 „ Brown, 2/24's woollen.
1 end Scarlet, 2/24's woollen.
6 ends White, 2/24's woollen.

24 ends.

Woven:—

19 picks Black, 2/24's woollen. per inch; 28 picks per inch;
4 „ Olive, 2/24's woollen. 8 healds; 16's slay; 2 ends in
1 pick Crimson, 2/24's woollen. a reed; 64 inches wide in loom;
56 inches wide when finished.

Soft finish. Weight 22 ozs.

Cheviot Trousering or Mantle Cloth.

No. 508.



Design

Warp:—

7 ends Brown cheviot, 2/18's woollen.
1 end Fancy twist.
7 ends Brown cheviot, 2/18's woollen.
1 end Mohair (looped)
3 ends Blue Slate, 2/18's woollen.
1 end Fancy twist.
3 ends Blue Slate, 2/18's woollen.
1 end Mohair (looped).

Straight Draft.

24 ends.

Woven all Brown cheviot, 2/18's woollen.

1488 ends in warp; 24 ends per inch; 22 picks per inch;
8 healds; 12's slay; 2 ends in a reed; 62 inches wide in loom;
56 inches wide when finished. Cheviot finish. Weight 22 ozs.

Mantle Cloths or Suitings.

No. 509.



Design

Warp:—

15 ends 1/26 Brown, twisted to 1/26's White wool-
len, 7 runs per inch.
1 end Black worsted, 2/48's, twisted to Canary
worsted 2/48's, and overtwisted with
2/48's Crimson worsted.
4 ends Blue 2/26's woollen.

Woven as warped.

Straight Draft.

2,304 ends in warp; 36 ends per inch; 32 picks per inch;
8 healds; 9's slay; 4 ends in a reed; 64 inches wide in the
loom; 56 inches wide when finished. Clear finish. Weight 24 ozs.

No. 510.



Draft

2,232 ends; 36 ends
per inch; 36 picks
per inch; 19's slay;
2, 2, 2, 2, 2, 2, 2, 1 ends
in reed; 62 inches wide
in loom; 56 inches
wide when finished.

Plan.

Weight 16 ozs.

Warp:—

2 ends Blue, 20 skeins.
2 „ Olive, „
2 „ Blue, „
2 „ Olive, „
2 „ Blue, „
2 „ Olive, „

Weft:—

3 picks Black, 20 skeins } 4 times.
1 „ Green, „
3 „ Black, „
1 „ Fancy twist as in warp.

1 end { Olive, 40 skeins twisted to Green Olive, 40 skeins } forming
„ „ „ „ „ } 1 thread.



MACHINERY, &c.

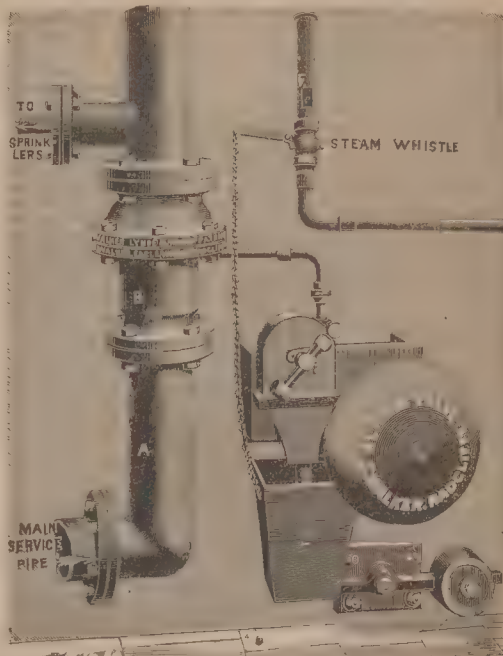
A New Picking Motion for Looms.

Mr. Hezekiah Lister, of Great Horton, Bradford, has patented a new picking motion for shuttles in weaving looms. The new apparatus is simple, and consists of a wrought-iron link chain connecting the picking stick and the picker, the latter of which is round at the top. Attached to the picker are two levers which give propelling power, whilst behind the levers is a spring which draws the picker back to its proper position. Those acquainted with the old picking apparatus will at once perceive the great advantages of the patent. In the first place, the connection between the stick and the picker being a wrought-iron chain with steel pins, great saving will be secured by its use as compared with that of the leather strap. Another important advantage, no less welcome to the weaver than to the manufacturer, is the improvement in the picker. Under the old system, the holes, through which the strap was passed in the picker, with constant wear enlarged, causing an irregular motion, and consequently a greater danger of the shuttle flying out and injuring the weaver. In the patented system, there are no holes to be thus worn, but the chain is attached to the top of the picker, whilst its direct motion is further guaranteed by the lever which presses upon it. Besides, this once set, the weaver cannot alter the chain as is the case with the strap, and thus the overlooker has a greater power over the working of the loom than formerly. The use of the spring behind the lever is for the purpose of drawing back the picker into its position. Under the old system, there being no spring for this purpose, the picker was apt to stop before returning to the proper point, and had to be forced thither by the returning power of the shuttle. This colliding between the shuttle and the picker caused the web to come off the bobbin, consequently a defect in the piece resulted. The new apparatus proves itself superior by avoiding such cause of defect by bringing the picker back to its proper position. The new system can be easily adapted to old machinery, no cutting away being required, save a few inches from the end of the stick, and its permanent character and advantages over the old one should win for it favour in the eyes of manufacturers, as it has already done with several experts who have seen it at work. The apparatus is the outcome of the labours of Mr. H. Lister, his two sons, and a son-in-law, Mr. Thewlis.

Continuous Alarm Valve for Sprinkling Installations.

A few months ago, we described the new sprinkling apparatus which has already been fitted up in so many of the mills in the textile districts, and which have been taken in hand by insurance companies. The utility of these sprinklers has been fully proved in cases where fires have taken place in large cotton mills, which would have undoubtedly destroyed the buildings and their contents but for the effectiveness of the sprinklers in immediately coping with the fires. In many cases, companies now refuse to insure factories except on the express stipulation that the sprinkling apparatus is fixed throughout the buildings, consequently millowners are now remedying matters by having the work done as speedily as possible. An apparatus has recently been brought before us which creates an alarm on the immediate outbreak of fire in any part of a mill, provided the mill has been fitted up with automatic sprinklers. The mechanism is being produced by Mr. S. Walker, Engineer, Radcliffe, near Manchester. It is made to work in connection with the patent automatic sprinkler known as the "Vulcan," and has already been fixed in many large factories. The accompanying illustration gives the main features of the apparatus, and the following description will enable our readers to judge of its capabilities to fulfil the advantages claimed for it. The apparatus is fixed at the most convenient point outside the building, and is connected with the upright pipe A, which we may state is already in use for supplying the sprinklers. This supply pipe is fixed vertically against the wall of the building, with branches opposite each floor level, to which are attached the smaller pipes for feeding the sprinklers. In cases where the supply of water comes from the town's main, it is usual, as a precaution against the supply being cut off, to fix a large tank, capable of holding about 5,000 gallons of water, at such a height as to maintain a sufficient pressure necessary for the top set of sprinklers, independently of the supply from the town's main. The apparatus is constructed and fixed in the following manner: Nearly at the bottom of the supply pipe A an alarm valve B is fixed. A small outlet pipe connects this valve with a turbine C. On the right, and in close proximity to the turbine, is a gong D. Below the turbine, a tank E is suspended on a weighted lever. Connected with this tank by means of a thin chain is a steam whistle F. Assuming that the whole of the sprinkler pipes have been charged with water at the necessary pressure, the valve B, which has been opened during the process of charging, is brought back to its normal position, and in this position discharges the functions of an equilibrium valve, and will remain so until a portion of the pressure is withdrawn from it. It will be obvious that, simultaneously with the going off of any one of the sprinklers, a corresponding amount of pressure used by this sprinkler will be withdrawn from the valve B. The consequence will be that the valve, losing its equilibrium, actuates a small auxiliary valve, and causes water to flow into the turbine C, which at once commences to rotate quickly, and having a hammer

fixed at the outside end of the turbine shaft, this hammer strikes the gong on each revolution of the turbine, and thus produces the alarm. Should the water at any time, by any possibility, contain ingredients which would prevent, or impede, the rotating motion of the turbine, the alarm would nevertheless be raised, for the patentee has provided against such a contingency by connecting, in an ingenious manner, a steam whistle, which will come into operation whether the turbine revolves or not. As we have previously stated, a small tank E is suspended on the end of a weighted lever just underneath the turbine. As the water passes through the turbine, it is received by this tank, and when a sufficient quantity of water has entered the tank to cause it to overbalance the weight



at the other end, it falls down and brings with it the chain which connects it with the steam whistle: by so doing, the whistle valve is opened and the alarm raised. Should it transpire on the arrival of the first individual on the scene, after a careful examination, that the fire has been extinguished by the aid of the sprinkler, the first thing necessary, in order to cause the alarm to cease, is to turn off the supply of water at the main. The turbine will then discontinue revolving, and the hammer cease to strike the gong. By the supply being cut off, the tank, having a small aperture in the bottom, will empty itself and resume its normal position, with the result that the whistle valve will be allowed to close. The apparatus can be seen in action upon applying to Mr. S. Walker, who will furnish detailed particulars.

Patent Carbonizing Machine.

In a former issue of this Journal, particulars of an improved carbonizer made by Mr. J. Illingworth, Whitelee, Batley, were given, since which further improvements have been made in the machine, thus placing it in the front rank of mechanisms of this description. The apparatus, which is specially made for destroying vegetable matter, such as cotton and jute, contained in rags and piece goods composed of cotton and woollen, and also for destroying burrs, seeds, straw, or other vegetable matter contained in, or mixed with, wool, woollen waste, or any other fibre or fibrous material, has now been before the textile trades for some time, and has met with much favour. The improvements recently made, being the result of careful study and continued experiments, have rendered the apparatus efficient in every respect. It is now guaranteed to do its work thoroughly, at a very low cost, and inconvenience to the workman is reduced to a minimum. The machine is heated by steam, and the heat can be kept at one uniform temperature by keeping the steam at one pressure on the steam gauge, which is much better than fire heat, the latter having a tendency to vary considerably. Common spirits are used, and this obviates the necessity of clearing out retorts, and, consequently, saves much time which would be expended in this unpleasant work. The temperature of the interior, where the carbonizing operation takes place, is not affected by outside changes, and this fact insures a perfect working upon the material contained in the machine. This is a great desideratum in countries where the climatic variations are frequent. In working, the material is acted upon in

a regular manner, there being little or no difference in the time occupied in carbonizing any given weight or bulk of goods, whereas, in many other processes, there is often a considerable variation in time, resulting from the irregularity of the temperature and other conditions. The mechanism of the apparatus is simple in its arrangements, and as the gas operates only on an inner cage, the deterioration is very little, owing to the equable temperature kept up. When the machine is at work, a slow but regular motion of the cage keeps the material agitated, and turns it over lightly; this movement prevents any rust accumulating upon the iron parts. The pipe from the retort being lined with pot, no evil effects result from the gas. The saving in using the machine will be apparent when we state that one machine will carbonize one ton of rags per day of 12 hours, with one man attending it (allowing for usual meal hours), and the cost of spirits being less than 5s. per ton, it will be seen that the work can be done for about 10s. per ton. If two men are employed, considerably more can be done. We may add that the apparatus does not cause any nuisance as far as the gas is concerned, this being a decided advantage over many systems of carbonizing. Mr. Hingworth will be pleased to furnish full particulars and prices on application, and will show the apparatus at work to those interested who will call at his establishment.

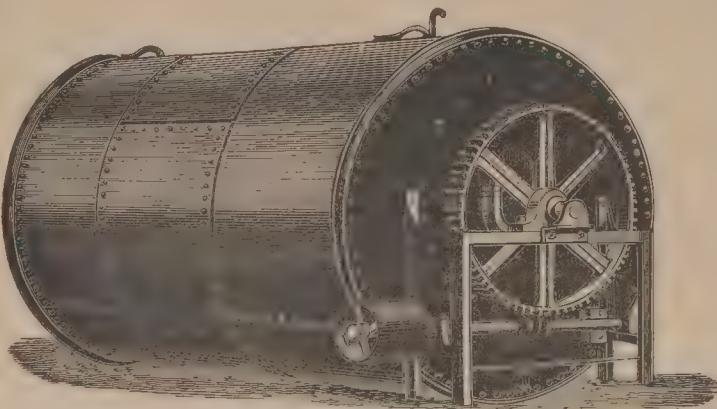
Loom for Weaving Coir and Manilla Matting, &c.

In the manufacture of machinery for the manipulation of fibres of the hemp, coir, and such like species, there has hitherto, in modern times, been but small advancement made, especially when the rapid strides that have been taken in various other departments of the textile trades are taken into account, but, as frequent inquiries are made from countries where the rougher fibres are grown, notably from Manilla and portions of the East Indies, for more efficient mechanism for weaving purposes, and as it is seldom that any new and effective machinery for the above purpose is brought before those interested in this special branch, we have pleasure in calling the attention of our readers, part of whom are engaged in the business, to a loom being made by Messrs. Soutar, Lehmann and Co., Bloom Street, Manchester, which should prove of advantage to manufacturers of mattings, carpeting, and similar classes of heavy goods, made of hemp, jute, manilla, pine-apple, coir, Brazilian wood, and other fibres, both at home and abroad. The general mechanism of the loom may be seen from the illustration. It is constructed in various widths, ranging from 30 inches to 80 inches reed space, this, of course depending upon the width of goods required to be woven. The framing of the loom, as regards the strength of the working parts, is the same whether for coir or manilla goods, the only difference being in the taking-up motions for the woven fabric. For coir goods, the warp-yarns are drawn from a specially constructed creel placed at the back of the loom through cast-iron fluted rollers, and the woven material is drawn out of the loom by means of two similarly fluted cast-iron rollers. For Manilla goods, the warps enter the loom in the same manner, but the woven fabric is automatically wound on a beam furnished

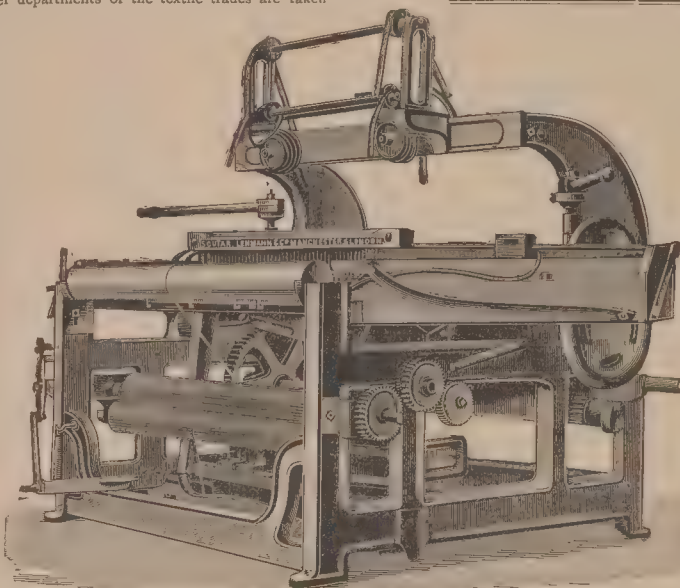
with spiked teeth, which maintain a firm grip of the cloth, and effect an even folding. The sleys are made with shuttle boxes large enough to hold shuttles containing cops 15 inches long by 2½ inches diameter, for coir yarn, and 12 inches long by 2 inches diameter, for Manilla yarn. For the purpose of forming these cops, a specially constructed winding machine is used, which gives off the yarn from the inside of the cop, in order that the

whole may be woven with the least possible waste. Each loom is sent out complete, with its full set of reeds, harness, shuttles, pickers, and strapping-up. When fancy, or figured, goods are to be made, the tops of these looms are furnished with a "Dobby" or Jacquard apparatus, constructed with a certain number of shafts, according to the pattern to be woven. The motions are all self-acting, the framework and the working parts being strong and heavy, and the sley so arranged that it can be made to beat up twice or thrice to each pick, according to the description of goods in the loom.

When very heavy goods are being woven, such as the weightier descriptions of coir and Manilla carpetings, the loom should be stopped after each pick, that is, after the sley has been knocked up to its required number of beats. This is done by the weaver placing his foot on a lever, moving the driving-strap to the loose pulley, and thus stopping the loom. The weaver then draws up the web tightly with his hand, and starts again. This operation ensures good and perfect selvages. When the lighter goods are being woven, this stopping is not necessary, as the yarns being lighter are more manageable. In the general arrangement of the looms, the parts are so well constructed that they combine efficiency with a minimum of wear and tear. Messrs. Soutar, Lehmann and Co. will supply them complete for working, and will also furnish estimates for the fitting up of complete factories with looms for making matting of all descriptions.



Carbonizer.



Matting Loom

A Useful Gift.

Mr. Lemuel Clayton, silk spinner, of Halifax, has made a gift to the Alroyd Park, Halifax, which ought to be especially valued by technical students. A room specially fitted up contains a liberal selection from Mr. Clayton's extensive collection, obtained chiefly by him during his foreign travels. There is a valuable and useful assortment of textiles, which may, in the near future, form the nucleus of a technical school collection—choice examples from the looms of Delhi, Agra, and other cities of Southern India, the silks of Mysore, and specimens of the peculiar and skilful needlework of Madras. In the Chinese collection are examples of silk embroidery, wood work, and curios in metal and wood; there is also a varied collection of household deities, or "josses," in wood and metal. From Japan is an extensive and varied collection—silk

goods, carvings, inlaid work in ivory, wood, and metal, and some antique figures in bronze; also a number of altar pieces in bronze from the various Buddhist temples. There is also a miscellaneous collection, containing a case of silks in all stages of manufacture, a rare collection of Sévres plaques (1824), and an enamelled casket (Limoges) mounted in silver.



Consular Reports.

A foreign Consul in Cuba says that the heat of the climate renders cotton or linen clothing necessary. Everybody, including the negroes, wears white drill or brown holland, a costume of the former material costing from £3 to £3 10s., and of the latter from £1 12s. to £1 19s. The colours most in favour are white, grey, brown and blue, and small checks are also popular. Could not our makers send out such blouses as are commonly sold in France for 6s. or 7s.? They would sell very well in Cuba. There is a magnificent paper mill lying idle at Boolak, a suburb of Cairo. It was built by Ismail Pasha, but it was closed when he was deposed. The machinery is being destroyed by rust. This is a frightful shame, for the Egyptian Government alone consumes a vast quantity of paper of the best quality. There is an opening in Corea for cheap linen and good cotton goods, such as sheetings, duck drills, cotton unions, and others that are stout and strong, and which will preserve a good appearance after the somewhat severe ordeal of a Corean washing. Corea produces cotton of a superior staple, especially in the provinces of Chullado, Whanghaide, and Pignando. The crop is largely consumed at home in the manufacture of the strong and excellent native home-spun, but the native merchants assert that there must be a considerable margin left for export purposes. Attempts are being made in the Luccan paper factories to produce paper from a plant known as Sulla. It is said that the first experiments have been very satisfactory. A Belgian Consul says that in spite of the unfavourable position of the silk trade, Italian manufacturers have been fairly active. Silk weaving is but little practised in Tuscany, the mills being chiefly employed in spinning. Little is done by machinery. Women are employed, whose wages vary from 6d. to 1s. 3d. per day.

THE TRADE AND MANUFACTURES IN THE DISTRICT OF KHARKOW (RUSSIA).—A foreign Consul says that there were 687 manufactories of various kinds at work in the province of Kharkow, at the beginning of 1886, the value of their aggregate production amounting to 34,000,000 roubles. The sugar industry of this district is increasing rapidly; the other principal industries of this province are wool scouring and the production of salt. The largest wool scouring establishment is at Grigoropka, near Kharkow, and belongs to a Moscow company. The average quantity of wool scoured annually at these works amounts to 400,000 poods, and the raw product is assorted into eight qualities, which sold in 1886 at 24 roubles to 45 roubles per pood. The machinery used in this establishment dates from 1874, and was supplied by the firm of Grand Railway Kaivers, of Verviers. The three fairs held in Kharkow every year in January, June, and October contribute mainly to maintain the commercial relations of this district with foreign countries. As regards the import trade, Germany heads the list, and supplies more than twice as much as Great Britain, which comes second. The principal articles of importation are metals, agricultural machinery and implements, and woollen and cotton textile goods. Lead comes almost exclusively from Great Britain; oxide of zinc and lead from Germany. Textile goods, though still imported to some extent, are now supplied in considerable quantities by the manufacturers of the country. Sewing thread comes only from Great Britain. A credit of six months is usual in sales of iron, machinery, and chemicals; and a knowledge of the Russian language is almost indispensable in doing business with this market.

GERMAN TRADE WITH JAPAN.—The French *Journal Officiel* recently published a letter from the French Consul at Yokohama, in which he points out the extreme activity with which the Germans are pressing their goods upon the Japanese market. The German merchants, he says, have been essentially practical in their mode of developing a trade with Japan, and in directions where other nations leave the field open through timidity or lack of enterprise, the Germans push on and win complete success. The French Consul desires to persuade his countrymen that it is useless to send out prospectuses unless travellers

are also sent, and that specimens of goods ought to be personally brought under the notice of the Japanese consumer by agents provided with the needful authority to form contracts on the spot, while the houses at home, who form such contracts and receive orders, should see to it that these orders are executed promptly and satisfactorily. These are the steps which the Germans are careful to take, and which lead to their mercantile successes in the East.

TRADE EFFORTS AT TABREEZ.—Mr. Consul-General Abbott reports that the Austrian merchant from Vienna, who brought some samples of merchandise to Tabreez in 1886, has now opened a "Bon Marché" in that town, for the sale of articles of clothing, haberdashery, and fancy goods; but no serious competition with the English import trade, as regards coloured and plain cottons, has yet set in from the Russian side; nor does the Consul anticipate that foreign competition injurious to British enterprise, in a commercial point of view, will take place, if British manufacturers, importers, and Chambers of Commerce, continue to keep in view those important points in connection with Manchester cotton goods which he has specially referred to in previous reports. Superior cloth, good printing, durable colours, and designs best suited to the Persian taste, must be brought into combination in order to maintain British supremacy in the manufacture of those articles and ensure permanent success.

Improvement in Bleaching.

Wachter considers it advantageous to add glycerine to the solution of bleaching powder and soda used in bleaching. He uses the following mixtures:—Water, two hundred parts; bleaching powder, twelve parts; soda, twenty-five hundredth parts; glycerine, fifty hundredth parts. The glycerine is not to be added to the bath until twelve hours after its preparation. The inventor thinks that he obtains thus a greater degree of whiteness; but, what is of far more importance, the mixture loses its corrosive properties. After the bleach, no trace of chlorine remains in the goods, and there is, therefore, no need of souring. When the bleaching is ended, the goods are washed with cold and hot water.—*Leipziger Monatschrift*.

Proposed New Method of Making Returns of Cotton Sales.

The Statistical Committee of the Liverpool Cotton Association, Limited, have just issued the following proposal, the adoption of which they recommend:—The Statistical Committee have had under consideration the system of collecting the weekly figures, published by the association, and are of opinion that the discrepancy lately discovered in the estimated stock is attributable mainly to the altered conditions of business at the present time, and the difficulty of getting members to make returns under the proper heading, especially in the ex-quay and delivery transactions. The committee are of opinion that a change in the present system is advisable, in order to preserve the value of our statistics. After careful consideration, they think the simplest method would be to make the weekly returns consist of three items:—1, Return of all cotton forwarded to the trade; 2, Sales on spot, and prices; 3, Cotton received inland. If this system were adopted, the risk of error would be minimised, as each week's stock would be made up from three items:—1, Cotton actually forwarded; 2, Custom's import; 3, Custom's export. Thus, the weekly sales would be published only as information respecting current business, and not used, as at present, in calculating the stock. The committee further suggest that all warehouses for storage of cotton be registered in the association, and that it be a bye-law that delivery from other than registered warehouses shall not be considered a proper tender. The object of this is that the Liverpool warehouse keepers be asked to make returns of the number of bales in their warehouses at specified times during the year. From inquiries made, the committee have reason to believe such returns can be obtained without difficulty, and are of opinion that they would prove a valuable check on our figures. These suggestions, if adopted, will involve

some change in the form of the weekly circular, and will necessitate the stock being again taken, to make a new departure. The committee would point out that a serious difficulty arises in the possibility of not always being able to obtain returns from forwarders of cotton, such as the Oldham Cotton Buying Company. The committee are aware that, under the present condition of business, any system of obtaining statistics is surrounded by serious difficulties, but, the above, if faithfully carried out by members, appears to them the simplest way of obtaining the object they have in view.

Notes on Cotton Dyeing.

Antimony mordant.—Acid antimony mordants usually precipitate upon the addition of water. In order to prepare antimony solutions without the formation of such precipitates, Watson prepares first a solution of sodium, potassium or magnesium chloride, and adds antimony chloride solution to this; if sodium or potassium chloride be used, the solution must be saturated to prevent precipitation; but if magnesium chloride alone, or mixed with sodium chloride, be used it need not be saturated, nor is the presence of muriatic acid necessary to prevent precipitation. The explanation of this is that double chlorides of antimony and sodium, potassium and magnesium, are formed. **Full black on cotton yarn.**—The following receipt is said to give a very full and permanent black:—Cotton, one hundred pounds; cutch, six pounds; blue vitriol, two pounds. Dissolve, heat to 180°F. and work the cotton thirty minutes; raise, air and chrome with three pounds of bichromate at 160°F. Wring and rinse. Heat to 180°F., enter and raise to 185°F. Finally, sadden with a cold bath containing four pounds of copperas.—*Farber u. Zengdrucker Zeitung.*

The State of Russian Industry.

The report on the position of Russian industry during the year 1886 is not very favourable. It is true that, under the protective system, factories of the most varied kinds are being established all over the country, and that industrial branches which hitherto had been entirely neglected, such as ultramarine, gelatine, colour and chemical works, are being called into life; but these are mostly only hot-house productions, whose existence is solely based on the protective duties under which they arise, but also fall. The most important industrial districts of Russia, Moscow, Wladimir, Nishni-Novgorod, &c., are in an extraordinarily depressed condition in spite of the high protective duties. One of the causes of this is, no doubt, the increasing poverty and diminished power of purchasing of the people, and another, the large over-production during recent years. A further cause may, however, also be found in the indolent character of Russian manufacturers, which prevents their suiting themselves to the foreign markets, and impedes the introduction of innovations in the manner of producing their goods. Although a few branches of industry have attained a certain perfection, Russian manufacturers, upon the whole, dispose only of a small proportion of really technical educated assistants, in consequence of which, many manufacturers are not able, in spite of the high duties, to compete successfully with foreign producers. In factories and establishments where there is a really technically educated staff, no protection by protective duties is needed. Moreover, although native manufacturers are protected against foreign competition by high duties, they do not succeed even in many parts of Russia to protect themselves from the superiority of competitors in their own country. Thus, for instance, the cotton spinning establishments at Lodz (Russian Poland), have recently attained a vast development, and their productions compete, even in the Moscow market, with others of the same kind. When the other Russian industrial manufacturers saw the danger which threatened them from that quarter, and feeling unable successfully to battle with it, they appealed again to Government for help, although in this case, it was only native industry they had to compete with. Some of them pleaded for a customs' frontier between Russian Poland and the interior, and the imposition of high duties on Polish productions. Others, who recognised the impossibility of the former measure,

voted only for the latter. Government has not as yet made manifest its decision in this matter, and is scarcely likely to grant the demands of manufacturers. In 1885, Government issued a law which prohibited the nightwork of women and children, and created at the same time, inspectors of factories. These innovations caused a considerable amount of dissatisfaction amongst owners of factories. Several strikes also occurred in consequence of reductions of wages, unjust pecuniary fines, irregular payment of wages, &c.

ODDS AND ENDS.

A large firm in Hamburg which has been engaged very heavily in the Trinidad trade has got into financial difficulties.

Consul-General Grattan, of Antwerp, has asked Lord Salisbury to adopt Volapuk for Government despatches wherever two countries speak different languages.

According to a statement in the Swedish *Post och Inrikes Tidningar*, Sweden is making preparations for being amply represented in all departments of the International Exhibition at Copenhagen in 1888.

The *Moniteur Officiel du Commerce* states that the first commercial museum, for specimens of Italian commerce which has been established abroad, was opened at Buenos Ayres on the 26th of July.

The Cape revenue returns for November, according to a Capetown telegram, show an increase of £13,212, as compared with the corresponding month of last year. Railway receipts have contributed £10,331 to this result. These returns are held to justify the statement of the Governor at the recent Grahamstown banquet, that, after years of depression, the tide has now turned, and South Africa might look forward to an era of renewed prosperity.

Spanish and Portuguese buyers are very plentiful in Berlin just now. German producers are making great efforts to obtain an export trade in Spain, and they assert that their productions both in coal and coke will cost the consumer sixpence per ton less than British coal, and is superior in quality. The result, however, of an analysis recently made in Spain does not at all bear out this assertion. We shall not lose the Spanish market just yet.

The Germans are going to exhibit extensively in the Glasgow Exhibition. The Prussian Railway Administration will convey the goods over their lines at considerably reduced charges. Committees of manufacturers have also been formed for the Brussels and Barcelona Exhibitions. After long negotiations, the Dutch Government has consented to allow German officials to travel to and fro through Holland in order to receive the British mails at Flushing.

In order to prevent any possible misapprehension on the part of intending exhibitors at the forthcoming Melbourne Centennial Exhibition, it is officially stated that all exhibits will be regarded as in bond and duty free unless they enter into consumption in the Colony, but when sold they must pay duty at the current rates. No change in the general tariff will be made, nor, indeed, is any alteration possible until the next Budget is brought forward at the end of July. With regard to goods on which an increased duty may possibly then be levied, payment can be made at the existing rates prior to the alteration of the tariff, if any be made, and without withdrawal from the Exhibition. Any goods on which duty has been paid can be exported under a drawback.

Woolen manufacturers in America are in a very bad way. Many mills, with their plant, have recently been thrown into the market, and those disposed of have fetched only a small proportion of their original cost. A correspondent of the *New York Herald* expresses the belief that an advertisement asking for woolen mills at half-price would elicit even more replies than an announcement that a bull pup was in request. The cause of this depression is the impossibility of working at a profit with wool at the price to which it has been forced up by Protective duties. Native American wool is not produced in sufficient quantity to meet the requirements of the trade, notwithstanding that it has the advantage of a practical bounty in the duties imposed on foreign wool; while, at the same time, these are inadequate to counteract the superiority of British goods. Thus the American people have to pay excessively high prices for cloths, blankets, and all other kinds of woolen goods, without even the satisfaction of knowing that they are thereby supporting their home manufactures. As a matter of fact, they are only swelling the surplus of public revenue, which the Washington Government is sorely puzzled to know how to dispose of.

PATENTS.

Applications for Letters Patent.

Adjusting harness of looms. C. Schuder, London.	30th Nov.	16,496
Automatic fire-extinguishing sprinklers. T. Witter, Manchester.	9th Dec.	16,947
Automatic apparatus for regulating the backing-off motion in self-acting mules. J. Hope, London.	12th Dec.	17,077
Adjusting the bearings or cap bars of "top-rollers" for doubling or twisting yarns. C. W. Lancaster, Halifax.	14th Dec.	17,182
Applying stiffening substance (dress) or dye colours to lace gauzes, &c. C. J. Cox, London.	16th Dec.	17,337
Application of heat and combustion of smoke in boiler furnaces. W. Roberts, London.	24th Dec.	17,716
Bleaching, dyeing, and similar treatment of cloth, &c., and apparatus therefor. G. A. Schleber, London.	12th Dec.	17,102
Carding machines. J. Eadie, Lisbellaw.	2nd Dec.	16,589
Cutting cloth, &c. M. W. and H. C. Taylor, and G. F. Thomas, Bristol.	3rd Dec.	16,674
Combining machines. J. C. Walker, London.	3rd Dec.	16,708
Cast-iron split boss pulley for belting. W. G. Basley and W. W. Dickson, London.	5th Dec.	16,735
Colouring matters for dyeing, printing, &c. R. and J. W. C. Chadwick, London.	6th Dec.	16,810
Carding engines for cotton, &c. W. H. Richardson and W. Greaves, Manchester.	7th Dec.	16,829
Calendar or smoothing machine. R. Crawford, Belfast.	7th Dec.	16,836
Cloth laying machines. G. Browning, Leicester.	10th Dec.	16,995
Cutting pile fabrics. J. H. Smith, A. Goddard, L. Higginbottom and T. Mannock, West Gorton, Manchester.	10th Dec.	16,996
Carpets of the Turkish or Indian style, to be called "Harris Carpets," applicable to other long piled fabrics, and machinery therefor. H. B. Harris, London.	10th Dec.	17,044
Calico printing and similar rollers and cylinders, and producing patterns or printing surfaces thereon. W. and J. Thomson and A. F. Macfarlan, Glasgow.	17th Dec.	17,379
Circular knitting machines. C. De Negri, London.	29th Dec.	17,887
Drying apparatus for sizing machines, &c. Z. Holden, Halifax.	3rd Dec.	16,629
Driving belts. H. J. Fenner, London.	6th Dec.	16,756
Drawing flax, &c. J. Barbour, Belfast.	9th Dec.	16,944
Drop box looms. C. Hahlo, C. E. Liebreich and T. Hanson, Halifax.	10th Dec.	16,999
Execution and production of embroidery. S. Redhouse, London.	20th Dec.	17,509
Flyers for slubbing, intermediate, &c., machines. T. Howarth, London.	1st Dec.	16,522
Foundations for cards and combs for carding and preparing silk, tow and flax, &c. J. Crossley and W. Healey, Manchester.	12th Dec.	17,082
Frilling. C. G. Hill, London.	14th Dec.	17,234
Foundations used for silk combs and cards. E. Priestley, Halifax.	29th Dec.	17,867
Governing the speed of gas engines. R. Walwork, London.	17th Dec.	17,353
Heating or cooling rollers employed in "Calenders," &c. J. Lawton, Manchester.	30th Nov.	16,486
Holding pile fabrics during the beating or pile raising process. C. Longbottom, Bradford.	2nd Dec.	16,585
Heating and ventilating mills, &c. J. H. Roberts, Bradford.	20th Dec.	17,479
Jacquard machines. W. and H. A. Fielding, Manchester.	17th Dec.	17,426
Jacquard machines. J. Leeming and R. Wilkinson, Halifax.	19th Dec.	17,427
Knitting machines. A. J. Boulton, London.	29th Nov.	16,425
Looms for tufted or pile fabrics. S. Z. Lloyd, London.	29th Nov.	16,400
Looms. W. Gardner and E. S. Ware, Halifax.	30th Nov.	16,450
Loose reed motions of looms. S. Grimshaw, Halifax.	3rd Dec.	16,629
Linen damasks. A. M. Hart, London.	7th Dec.	16,847
Loose reed looms. R. Riley, Manchester.	17th Dec.	17,359
Looms. A. Storrier, London.	21st Dec.	17,505
Looms. S. F. Armitage and Sons, London.	29th Dec.	17,874
Multicoloured plush fabrics. W. Weegman, London.	29th Nov.	16,422
Method of, and means for, stopping spinning, &c., frames. H. Whitwam and H. Taylor, Halifax.	8th Dec.	16,895
Obtaining a cross-over finish and raising on cut-pile and other fabrics. J. Worrall and J. Kershaw, London.	13th Dec.	17,143
Opening and cleaning cotton, &c. Messrs. Greenhalgh, London.	16th Dec.	17,322
Operating drop-boxes and the healds of looms. G. H. Hodgson, Halifax.	27th Dec.	17,782
Obtaining a slow motion of the cylinders of carding engines. J. W. Massmith, Manchester.	28th Dec.	17,822
Picker preservers for looms. E. T. and M. J. Whittaker, Halifax.	2nd Dec.	16,588

Preventing accidents in putting straps on pulleys, and facilitating the lacing or piecing thereof. A. and G. H. Hughes, Manchester.	8th Dec.	16,871
Preventing waste and breakage of yarns on bobbins or spools employed in looms. J. Wright, Bradford.	17th Dec.	17,367
Preparing the fibre of flax, &c., for spinning into yarn. J. R. Garritt and W. Scott, Holywood.	22nd Dec.	17,658
Promoting combustion and economising fuel in the furnaces of steam boilers. John Cooke, Stockton-on-Tees.	23rd Dec.	17,659
Picture tickets for piece and dress goods, and for patterns of textile fabrics. J. H. Sambrook, Manchester.	27th Dec.	17,776
Ring spinning and doubling. O. Imray, London.	29th Nov.	16,419
Ring spinning and doubling. O. Imray, London.	12th Dec.	17,109
Revolving motion connecting the pickers with the picking sticks and straps in looms. G. P. Jacques and W. Holliday, Armley, Leeds.	15th Dec.	17,245
Raising the pile of, or finishing, pile fabrics. Sir Titus Salt, Bart., Sons and Co., and W. Hanson, London.	20th Dec.	17,489
Raising and lowering the healds and shuttle-boxes in looms. C. Bedford, Halifax.	22nd Dec.	17,591
Spinning, twisting and doubling yarn. A. Ambler and H. K. White, Halifax.	29th Nov.	16,367
Spindles and flyers for roving, &c., machines. J. Shorrocks, London.	30th Nov.	16,466
Stop motion for looms. H. Butler, London.	2nd Dec.	16,591
Spinning mules. S. Syddell, London.	5th Dec.	16,704
Sewing ropes, &c., with spun yarn or other twines. H. R. A. Mallock and A. Froude, London.	6th Dec.	16,811
Stretching woven piece goods. A. Birtwistle and T. Martin, London.	8th Dec.	16,911
Spindles for slubbing, intermediate, and roving frames. W. Shore, London.	7th Dec.	16,821
Shuttle-box motion of looms. J. Swallow and J. A. Sykes, Halifax.	12th Dec.	17,068
Screw gill-boxes, &c., employed in preparing fibres. J. Stake, Halifax.	18th Dec.	17,126
Stop-motion for looms. C. Bedford, Halifax.	14th Dec.	17,185
Stop-motion for vertical warping mills. B. Cooper, London.	17th Dec.	17,395
Steam boilers. J. M. Stratton, Glasgow.	19th Dec.	17,418
Stop motions for winding frames. W. T. Glover, Manchester.	23rd Dec.	17,661
Spinning fibrous materials. D. Proctor and H. McPherson, London.	27th Dec.	17,795
Spinning flax, &c. L. MacLaine, Kilbyleigh.	28th Dec.	17,828
Trap twisting frames for doubling yarns. J. Farrar, Halifax.	6th Dec.	16,752
Twisting, doubling, and reeling yarns. T. Hale, Halifax.	8th Dec.	16,899
Terry motion in looms for towels. J. Haydock and W. Rosseter, London.	9th Dec.	16,957
Thin metal wedge with rough points on one side for the purpose of fastening picking straps to pickers. W. Atherton, Todmorden.	14th Dec.	17,187
Transit holders or frames for holding pieces of plush, &c., in an extended state. S. C. Lister and J. Reixach, London.	22nd Dec.	17,640
Traversed warp machine. J. and J. R. Hancock and W. Tatham, London.	29th Dec.	17,879
Worsted fabrics. C. Holdsworth, Halifax.	3rd Dec.	16,632
Weaving and apparatus therefor. N. Molesworth-Hepworth, Manchester.	8th Dec.	16,883
Weighing automatically, or otherwise, wool, &c., and compressing the same. W. Warner, London.	8th Dec.	16,925
Winding laces, blockings, ribbons, &c. C. Whiteley, Birmingham.	9th Dec.	16,938
Wool combing machines. H. Wyman, London.	9th Dec.	16,967
Warp lace machines. W. Start, Jun., London.	14th Dec.	17,216
Wool combing machines. W. H. Bailey, Keighley.	24th Dec.	17,718
Winding cops in mule spinning machines. J. Jörg, London.	29th Dec.	17,895
Yellow and brown colouring matters or dye-stuffs. O. Imray, London.	21st Dec.	17,583

Patents Sealed.

13,894	14,941	15,103	15,106	15,219	15,285	15,343	7,640
11,497	13,111	13,129	14,087	14,682	14,971	15,066	15,076
15,290	15,360	15,412	15,415	15,435	1,677	2,361	2,362
6,826	7,079	11,248	11,570	11,665	13,638	15,599	15,600
15,608	10,049	10,586	2,382	5,440	7,226	13,722	14,076
15,680	15,793	15,805	9,657	11,935	6,937	13,391	13,428
14,181	15,136	15,336	15,529	15,582	15,922	15,934	15,944
11,325	7,740	11,425	16,110	16,175	16,284	1,228	8,852
10,867	11,426	11,437	16,062	16,101	16,397	126	127
11,501	11,668	11,954	12,358	12,474	10,431	11,334	11,401
12,064	12,544	17,105	875	11,447	11,979	12,709	12,728
12,749	12,819						

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Notices.

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A Foreign Textile Work.

BY MR. ROBERTS BEAUMONT, M.S.A.

Progress in the textile arts is contingent to-day upon very different conditions from what it was formerly. Years ago, the skill of the English inventor, and the industry of the English artisan were the potent factors which gave supremacy to our woven productions. Continental manufacturers now possess, however, precisely the same construction of machinery as that employed in home factories—in many instances made by English firms, and erected under the supervision of skilled and practical English mechanics; hence, we cannot expect to derive any permanent advantage in the future from the employment of more complete, improved, and more adequately adjusted appliances than those accessible to our Continental and American competitors. Machinery of the newest construction is a cogent auxiliary to successful manufacture, contributing very materially to the turn-out of more perfectly produced goods; but it is evident that, if the pre-eminent position which woollen, worsted, and cotton fabrics, of English make, have acquired in the markets of the world is to be retained and bettered, other motors besides that of precedence in mechanical invention, will necessarily have to be called into requisition. Neither can reliance be placed on the superior aptitude to mechanical arts, nor on special adaptation to industrial pursuits, nor on the more skilful execution of the British artisan; for the workman of Belgium, France and Germany, has now for years been the recipient of the benefits of a systematic course of technical training, which must have

more efficiently qualified him for his handicraft, than is the case with the English artisan who has not received this class of trade education. The fruits of such instruction must naturally be manifest in the advancement and stimulation of the industry in which it is disseminated. Contemporaneously with our unprecedented, and, in many respects, unparalleled, development in mechanical contrivances for carding, combing, spinning, weaving and finishing of textile goods—which the last four decades of history have witnessed—the intelligence and foresight of Continental merchants and manufacturers have been devoted to the establishment of technical colleges, where their carders, combers, spinners, weavers and finishers, might learn, at a nominal fee, the why and the wherefore of the particular departments of industry in which they are engaged. More competent and skilled workmanship is not the solitary boon which foreign manufacturers have derived from the inauguration of technical classes, for, as a result of the success of such instruction, a textile literature of considerable dimensions has sprung up, fostered and encouraged by those interested in the advancement of technical education. Books, dealing with the abstruse questions relating to woven design and its cognate subjects furnishing a lucid analysis of the principles of manufacture, ought to be favourably considered by those seeking to make progress in a study of the textile arts. The value of such works is not to be estimated by the pleasure their perusal affords to the true student, though that is considerable, but rather by the useful and exact knowledge they impart to the reader. Foreign manuals give us an insight into methods and processes of manufacture which are more or less new to us, hence, information may be culled from their pages not, as a rule, to be found in English sources. To a new Belgian treatise, entitled, "Cours Méthodique de Tissage," by MM. G. Lelarge and A. Ledent, we propose to direct attention, in order to unfold the Belgian system of imparting textile instruction, and also their principles of producing pattern or design in woven goods. This course may be profitably pursued because it affords us an opportunity of contrasting the systems and processes of manufacture in the centre of industry in which we are engaged with those practised in Belgium and elsewhere. To draw such a parallel forms a healthy study, and one calculated to prove both interesting and fructuous. The work before us is one of the most recent textile volumes that has issued from the Belgian Press, and deals specifically with design as applicable to the woollen and worsted branches of woven productions. The authors are persons of experience and technical skill—M. Lelarge being professor of weaving at the Professional School of Verviers, and M. Ledent a mechanical engineer. In the preface to the book, they define their system of handling the subject thus:—"Weaving may be considered from two distinct standpoints. Primarily, without describing the characteristics of the threads employed, or the mechanical appliances used in the design constructed, it is feasible to review the numerous methods, the thousands of different plans of intercrossing yarns to obtain cloths of the most varied aspect, texture and effect. . . . Each of these results depends entirely on the mode of interlacing the threads which compose the fabric. Thus, given a knowledge of the various systems of interlacing, and the effects they severally produce, the characteristics which each imparts to the fabric, it remains to study the second phase of the subject, which consists in executing the plan adopted in realising the design theoretically; in other terms, in selecting, first, the yarns of the right quality, thickness and shade, then of submitting them, by the aid of special appliances and of the loom, to all the operations necessary to produce the crossing required, and to form a fabric adapted to the purposes for which it is destined. . . . Our intention is to specially demonstrate the rules and processes followed in the system of intercrossing threads to obtain any definite effect. . . . In the theory of crossing it may be said that, in reality, the art and science of weaving are united." That the whole art of textile design is based upon a diversification of the modes of intertexture is no new theory, and is one that has been so frequently elucidated that it is unnecessary at this time to more than allude to the subject in passing; but that the various plans of interlacing threads comprise the entire principles of woven effect, in all its bearings and relationships, is tantamount to teaching that cloth construction or build, that is the setting and regulation of the fineness, substance and texture of the fabric, are all factors

included in an accurate delineation of the design on point paper. Practical knowledge of the manipulation of textile designs is diametrically opposed to such a theory. Undoubtedly, a very important phase of woven pattern production is hinged upon a precise and comprehensive acquaintance with the diverse systems of intertexture; for it is patent to both student and manufacturer that design in textiles originates, in a primary sense, from the interlacing of two sets, or series, of yarns with each other. Exactly on the same principle as figure, or effect, in hand knitted materials is, in all instances, the product of a variation in stitch, comprising deft handling of the needle, so textile design, however simple or elaborate, is the resultant, or combination, of the various crossings of the threads, controlled and determined by the action of the loom. In treating of textile design, one important element that must have due cognisance, besides that of a correct mode of interlacing the warp and weft threads, is that of imparting to the fabric the qualities of uniformity and regularity of structure combined with softness and kindness of touch. On a first consideration, it might be supposed that a crossing, exact and regular in arrangement, would produce these desirable results, but, on further examination, it will be evident that a design, however correctly combined and adjusted, if not produced in the proper sizes of yarns, and in the counts of reed best adapted to its construction, a level and uniform texture is not feasible. The origination of a pattern is, to a considerable extent, theoretical work, and comes under the head of a knowledge of crossings or weaves; but it cannot be transferred to the woven fabric in such a manner as to develop its integral parts with precision and definiteness without an actual conception of the effect it will have in the loom under certain conditions as to the fineness of cloth, colouring, and finish. In a word, the soundness, firmness, elasticity, substance, and soft feel of a woven product may be as largely due to the utilisation of suitable sizes, or thicknesses, of threads as to the true construction of the design adopted in its manufacture. Attention should, therefore, not only be directed to the decorative part of textile design, but to the production of a fabric possessing these necessary characteristics. A designer of woven effects, like an architect, has not simply to contrive to obtain an expressive, attractive, and a beautiful exterior, or, in other words, merely to originate a fabric, neatly and tastefully ornamented with both form and colour, but to produce a compact texture, capable of bearing the tension and friction of wear, and of yielding a warm, cosy, and elastic garment. For this reason, the duty of one who expounds the principles of textile design should be to indicate to the student the connection that exists between theory and practice, between the arrangement of design on point paper and its actual development in the loom. Exact theoretical knowledge is a great desideratum, and the successful designer of the future will be proficient in this department of his work, but, at the same time, it is of paramount importance to be conversant practically with the process relating to the production of the design invented in the woven material, and even to possess a knowledge of the loom, its construction, its powers, and its limits. On this ground, it will be obvious that any textile treatise professing to deal in a methodical order, and in a complete manner, with the various types of woven patterns, but which only enters into the detail of the construction of several typical crossings, such as twill, mat, diagonal, check, and diaper, omits to impart information on the build or putting together of a compact textile structure. True, this system of analysis may be said to have one advantage—it enables the student to investigate, apart from any other considerations, with preciseness and accuracy, the effects producible by diversifying the plan of intertexture, but, as it does not furnish him with the principles of applied design, he can form no true conception of the practical, or woven, result of the pattern he originates, nor can he determine on the fineness of texture, or on the quality of materials requisite to develop the design produced in such a make of fabric as to bespeak its beauty and characteristics the most effectively.

(To be Continued.)

The French Government have decided to participate officially in the Melbourne exhibition, and have nominated the French Consul General at Melbourne the General Commissioner for the Republic. With a view to facilitating French co-operation, the time for making applications for space has been extended to the 1st March.

Weighting of Silk by B. Martinon.

The property possessed by silk of absorbing organic compounds and salts of metallic oxides is largely made use of to increase its weight and bulk. In former times, *weighting* of silk was but little practised, and was looked upon as an adulteration, not as a lawful industrial process. Now, however, it is carried on to a great extent, and the fact is so well known that silks so manipulated are sold for what they really are and not for pure silk. The materials employed in this process are both mineral and organic. Amongst the former, the one in most common use is bichloride of tin, which is commonly sold as a liquor of 50° B.; it contains then 21.22 per cent. of metallic tin. Products of 55° and 60° B are also in the market. The bichloride of tin is prepared by treating the proto salt with nitric acid, or with chloride of soda, or of potash. The necessary quantity of muriatic acid must be added to the solution of the protochloride of tin. The amount of nitric acid added is a little more than the theoretical quantity. The bichloride is diluted to 25° or 30° B., and the silk is worked in this solution. As soon as it is well impregnated, it is wrung out, better, extracted to remove the excess of liquid which is valuable, and then it is washed with a large quantity of water. The washing decomposes the bichloride in the fibre of the silk, and forms an oxychloride, which, by a bath of soda and boiling soap, is changed into the hydrated oxide of tin; this remains fixed. After the soda and soap bath, the silk is passed again into the bichloride, and the weighting is increased, as each passage through the bichloride adds about 8 per cent. to the weight. This method of weighting is used for whites and light shades; it is done before the dyeing, and does not interfere with it in the least, if allowance is made for the action which oxide of tin exerts on certain colouring matters. This mode of weighting silk is used much more now than it was five or six years ago, because it is better known how to apply the bichloride, and at the same time to preserve all the brilliancy and the feel of the silk. This method enlarges the fibre but little with the increase in weight, yet it is valuable for certain goods where a firm feel is desired. There is, however, one very grave disadvantage; silks, if weighted too heavily with binocide of tin, lose their strength and elasticity, especially if they are exposed to the sun. Other mineral substances, such as acetate of lead, have been tried to weight whites. Silk takes from a warm bath of sub-acetate of lead a certain quantity of oxide, but it acquires also a flabby feel which it is impossible to remove. Sulphate of baryta can also be fixed upon silk. The silk is passed through a bath of chloride of barium, extracted, and given a luke-warm bath of sulphate of soda. The greater part of the sulphate of baryta thus formed remains fixed, but the silk is lifeless, has a bad feel, and looks like cotton. It is almost impossible to restore its brilliancy without removing most of the sulphate of baryta. For dark shades, and especially for blacks, an oxide of iron, usually the hydrated sesquioxide, is fixed on silk. The product used for this purpose is an iron mordant (*rouille*), consisting of basic ferric sulphate. This mordant is a dark reddish-brown liquid, of 45° or 50° B., and to give good results must be free from ferrous salts, and especially from chlorides, and must contain about 2Fe₂O₃ to 5SO₄. If it is too acid, too little iron is fixed upon the fibre; if it is too basic, it keeps badly, and the fixing is poor, as a portion is fixed superficially, and is removed in the soaping and dyeing. The mordant is prepared by treating copperas and sulphuric acid with nitric acid. Nitrous fumes are given off, and these are absorbed in water to prevent a loss of nitric acid. Ferric nitrate, acetonitrate and chloride have all been tried, but the basic sulphate gives the best results as far as fixing iron is concerned. The weighting is done in the following way:—The silk is passed through a mordant of 30° B for boiled-off silks, and 15°–16° B. for souples; after the silk is thoroughly impregnated, it is extracted, and washed with much water. A calcareous water increases the quantity of iron fixed. The washing decomposes the basic ferric sulphate, forming a more insoluble basic ferric sulphate, which remains fixed upon the silk, and a soluble acid sulphate, which is washed away. After thoroughly washing the silks, they are passed into a lukewarm soda solution, and then into boiling soap. The alkaline baths decompose the sulphate, the colour is deepened, and the hydrated sesquioxide of iron remains upon the fibre. The whole treatment is repeated

5, 6 or even 8 or 10 times. The silk gains 8 to 10 per cent. from the first treatment; after that the gain decreases to 4 or 5 per cent. at the 7th or 8th dip. Of course, after each passage, the soda and soap baths are used. The reason that souple silk takes as much iron from a more dilute bath is that the gelatine existing in the souple silk fixes a certain quantity of iron. If a gelatine solution be added to basic-ferric sulphate, a precipitate containing oxide of iron and gelatine is formed. It rarely happens that silks thus weighted are to be coloured with artificial colours; they are principally coloured black. They can be blued with yellow prussiate in the usual manner. The weighting of silk with oxide of iron makes less trouble than the weighting with bichloride of tin. Light and air affect the silk much less rapidly, but, if too much iron has been fixed, the silk is weakened and burned. This can reach such a point that the silk will behave like tinder. This danger is lessened when tannin also is fixed upon the same silk, as is customary. The weighting with oxide of tin has not advantages sufficient to make up for its drawbacks, yet a 20 to 25 per cent. weighting can be tolerated in certain articles. The case is entirely different with oxide of iron. It aids in fastening the tannin, enlarges the fibre, and helps to form the shade. Its use is therefore rational. The organic materials that are employed for weighting silk are sugar, glucose and the tannins. The weighting with sugar is only used for whites, and for very light shades, and it is done by passing the dyed silk through a sugar solution at 20° to 25° B. The silk is worked in the bath until it is well impregnated, then it is drained, extracted and shaken out, to remove, as far as possible, the liquid, and to separate the threads. The silks are then dried and the sugar is fixed in a sufficiently uniform manner. Silk will take up about 15 per cent. of its weight in sugar from the bath. It is only weighted superficially and does not resist washing. Such silks are spotted by the least drop of water, and they often take up moisture from the air and lose their stiffness. Sometimes, extract of bitter quassia is mixed with the sugar solution to prevent the flies from gathering upon the sugared silk, and sometimes a portion of the sugar is replaced by Epsom salts. The sugar baths are kept up to strength by the addition of concentrated syrup. When they have become very dark-coloured, they are filtered through animal charcoal. The use of sugar has greatly decreased, and has been replaced by the use of bichloride of tin. Sugar does not remain fixed like the oxide of tin, but it does not injure the texture. The main trouble is the spotting, and the fact that not more than 20 per cent. can be added to the weight of the silk. Weighting with tannin can be done with tannin from any source; those principally employed are nutgalls, sumac, cutch dividivi. For blacks, chestnut bark liquor is also employed. The tannin solutions are first prepared. As the relative quantity of tannin and silk determines the weighting obtained, the silk is treated with a bath containing 25 or 50 or 100 per cent. of the weight of the silk, as is desired. The treatment may be either warm or cold. Cold weighting is done by passing the coloured silk through a cold tannin bath. As soon as the silk is thoroughly impregnated, and the desired shade obtained, it is wrung, extracted and shaken out, and carried to the dry-room. The gain in weight from a 2° or 3° B. solution is from 10 to 18 per cent., according to the quality of the silk. Only a part of the tannin is really combined with the silk, the remainder is fixed mechanically. Hot weighting is begun in a boiling tannin solution. Colouring matters can be added, or even the dyeing done completely in this solution; but, generally, most of the colouring matter is placed upon the silk first; the tannin is put upon the coloured bottom, and the shades finished in the tannin. The silk is worked until the tannin is entirely cold; it is then washed, brightened, and dried. With a bath of 2° or 3° B. the silk will be weighted in this way to the extent of from 30 to 35 per cent.; with a bath of 4° B. it can be made to take 50 or even 60 per cent. This method of weighting can be combined with the metallic weighting, as in the case of blacks, when the gain in weight will amount to 100 or even 150 per cent. of the original weight of the silk. Souple silk gains more from a tannin bath than boiled-off silk, as the fats seem to hold tannin. When these operations have been well performed, the tenacity and elasticity of the yarn will be found to be increased decidedly; the brilliancy and the feel to have been perfectly preserved. After a long time, the shade of the silk becomes slightly lighter,

owing to the oxidation of the tannin, but this action is so slow that by that time the colouring matters will have changed from their original shade. The employment of tannin is justifiable, and is even advantageous.—*Le Teinturier Praticque.*

The Associated Chambers of Commerce.

The twenty-eighth annual meeting of this association, to be held at the Hôtel Métropole, London, on the 21st, 22nd, and 23rd of this month, will be a busy one, even if half of the questions upon the programme are discussed. No fewer than sixty resolutions have been put down by twenty-three chambers of commerce for consideration, and of these, the London Chamber supplies six, the Bradford Chamber eight, Leeds five, Newcastle, Gateshead, and Portsmouth four each. There are some subjects which will be discussed for the first time, but there is the usual long array of resolutions upon educational, Post Office, telephone, railway, shipping, canal, bankruptcy, and legislative matters. The London Chamber, on the coal and wine dues question, proposes that, if a continuance bill be brought in next session, a petition should be presented to the Houses of Lords and Commons, praying that they will not sanction the same, whilst, from the same source, spring two resolutions on commercial education, and one each on the railway constitution of Burmah and South-West China, the codification of the law of arbitration, and decimal coinage. Bradford and Heckmondwike are of the same mind with regard to the great results which might follow from an International Arbitration Treaty, and the resolution of the first-mentioned provides for a memorial, or deputation, to the Government urging them to give every encouragement and eventual support to a movement which, besides being rich in future promise, assumes a practical shape when limited to the United Kingdom and the United States. The Leeds Chamber will direct attention to the necessity of urging upon Her Majesty's Government the importance of the development of British trade with Tibet, and the desirability of taking such steps as may be deemed advisable to give effect to the convention on the subject made in 1886 between this country and China, also to the desirability, in the interests of British trade, of encouraging the formation of railway connection between India, Burmah, and South-west China, and to the re-introduction into Parliament, during the coming session, of the bill relating to the liability of machinery to be rated for the relief of the poor. Oldham intends to oppose the Boiler Registry and Inspection Bill, 1887 (introduced into the House of Lords by the President of the Board of Trade last session), which it considers unnecessary, as shown by the rapid diminution of accidents which have taken place during the past few years, and as only likely to further embarrass trades already sufficiently harassed by Parliamentary enactments. A discussion on Fair-trade may be looked for upon a resolution by Barnsley stating "that it is desirable that such changes be made in the fiscal arrangements existing between Great Britain, her colonies and dependencies, as will materially tend to increase the volume of the trade of the British Empire." The important question of commercial union between Canada and the United States will be raised upon a resolution merely requesting the Council of the association to vigilantly watch its development, and to communicate to the Colonial Office the fact of the great interest taken by the chambers in this matter. Wolverhampton submits a proposition to the effect that the programme of any one meeting of the association shall be limited to ten resolutions for discussion.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, January 28th, was 367. The number in the corresponding four weeks of last year was 356, showing an increase of 11. In addition to these gazetted failures, there were 151 Deeds of Arrangement filed at the Bills of Sale Office during the month. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, January 28th, was 874. The number in the corresponding four weeks of last year was 912, showing a decrease of 68. The number published in Ireland for the same four weeks was 68. The number in the corresponding four weeks of last year was 65, showing an increase of 3.

The Trade of the World.

[From Special Telegrams and Sources of News all over the World.]

A Paris correspondent says:—In the Paris market there is a decided return to the taste for British woollen goods which prevailed some years ago. All Scotch cloths are known in Paris by the name of Cheviot, whether they are plain, striped, or checked. The favoured style is a tiny check, in which many colours are introduced, but so thoroughly mixed up together that not one predominates over the other. The striped woollen material, called limousine, is also very popular for dresses, and also for long mantles in the redingote style. The stripes are of irregular width and of different colours, such as green, blue, red, and yellow, over a beige or brown ground, but all these colours are in softened down tints, so that the general effect is not loud. In spring goods, there is a new style of droguet with narrow stripes, worn so as to imitate embroidery in two or three shades of colour over a beige or grey ground. Another pretty material is a small check pattern, formed of silk threads of a lighter colour upon a woollen ground, in the basket-work style. In self-coloured materials, there are extremely pretty crepons, veilings, both plain and brocaded, Indian cashmeres, and muslindelaines. Mouse-grey is the favourite shade of colour for the coming spring. As regards braiding, it is more fashionable to braid in black over coloured cloth than to match the braid to the material.

A Berlin correspondent says:—Some new materials for dresses have arrived from the French capital, amongst others a woollen tulle with cashmere applied in arabesques, the borders being formed of silk, or of silk and metal. These tulle are lined with surah of various colours to match the cashmere arabesque, and have a very rich effect when trimmed with lace or striped moire ribbon. Some beautiful damask diagonals are contributed by the Gera manufacturers, at present only in black, but they will appear in various colours later in the season. This material is especially suitable for mantles, costing in Berlin 35 to 60 marks. Alsatia sends patented materials for dust cloaks, consisting principally of a grey mohair ground, with "chevron" stripes, and threads of bright colours running through them. Sicilienne and *peau de soie* of the same colour as the threads form suitable trimmings for such garments. Important orders have been received from Great Britain for plain and striped "gloria" and striped mohair for mantles, and such is the demand for these materials that contracts have to be made far ahead. "Passementeries" are offered of new and varied designs, especially of pure wool fringe, with shaded effects in different colours.

NEW FABRICS IN ROUBAIX.—We learn from a correspondent, that the Roubaix manufacturers are giving their attention to the production of woollen velvets, which seem to be coming into favour, especially the "Velour rayé" and "Velour uni beige." These materials have a beautiful velvety appearance, and are produced in various colours, the grey being especially in demand. There is also a good inquiry for thick ribbed ottomans, which are offered in entirely new shades of colour. Cashmeres in olive and bronze, and long striped "deux tons," are much sought after for light mantles. Another new material, produced by the Roubaix manufacturers this season, consists of a worsted stuff shot with silk threads—for instance, blue with light grey, brown with blue, &c., and the tasteful appearance of this article cannot fail to ensure it a ready sale. Foundation cloths have a good sale, and some interest is shown in metal lace stripes. A very handsome cloth now being made is composed of a milled thread forming small dots, and giving a very good reflection in a glass. It is called *brisé de mer*. For the winter, the Roubaix manufacturers are preparing goods of the Amazon type, and some orders have been already received.

THE STATE OF THE COTTON TRADE IN SPAIN.—A Madrid correspondent says that great complaints are heard from the cotton manufacturers in Catalonia, where 30 mills are now closed, most of which are for sale, and even those which are still open only work three days in the week. The number of unemployed hands in Barcelona is estimated at 2,214, and the whole province of Catalonia at no less than 15,000. Many attribute the crisis in the Catalonia cotton trade to the new treaties of Commerce, and demand the re-introduction of high

protective duties; others state that the consumption of the country has diminished, owing to the reduction in the price of wine, corn, and cattle, and some, on the other hand, assert that the Catalonian manufacturers have not kept abreast of their competitors. According to the last official report, 31,391,396 kilos. of raw wool were imported into Spain up to the end of October, 1887, against 37,144,714 kilos. in the same period of 1886.

HINTS FOR BUYERS FROM PARIS.—A new fashion in table linen has to be recorded, the trade in which has undergone a good deal of modification lately. A material called Russian linen, decorated with cloud embroidery, has come very much into fashion. Some of the articles have sporting designs upon them, or landscapes and figures worked in cross or hem stitch, presenting as nearly as possible the same appearance on both sides. A similar article is produced in France, but on these the patterns are woven and not embroidered. The cost is therefore much lower. Fancy embroideries are also largely employed on damask linens of various qualities. Serviettes are embroidered at each end with cross stitch, then stitch *point lancé*, &c., in various colours. They are often finished off with a knotted fringe like macramé. Table linen is mostly of figured damask, the buttons being sometimes reproductions of the Renaissance style. Ecru diaper or damask linen is very popular for ordinary use. It always looks well, and is not very expensive. Madame Carnot is giving trade in Paris a distinct filip. As she issues from seven to eight thousand invitations at a time, it is not wonderful that light silks have ousted dark ones in the shop windows, and that pretty gauzes are universal.

The French Vice-Consul at Fiume writing of Croatia, Hungary, Bulgaria, Roumania, and the Balkan Peninsula, says:—"Cotton goods are very largely used in these regions, and French makers might, with an effort, attain to a very satisfactory trade. Our prints and calicoes are as well known and better liked than those of English production, but our manufacturers do not take sufficient trouble to keep themselves posted up as to the immediate wants of the market, and as to the measures which ought to be adopted to render the trade a large and paying one." The Belgian Vice-consul at Tripoli, says that "merchants who wish to introduce their goods there, and to obtain a share of business in Tripoli, should send a good supply of samples. Goods made at Vienna are often sold as French, and are of elegant shape and good material. With respect to lace and gimp, Nottingham does a large trade in imitations in all kinds of French, Belgian, Irish and Spanish productions, as well as in tulle mantillas, of the kind made in Barcelona. These mantillas sell readily, and form the favourite head-dress of the Spanish women. English ladies often buy them to send to England under the belief that they are of Spanish manufacture. A good many imitations of Spanish lace mantillas and so forth are also received from Switzerland. There is also an important trade in Maltese gimp which is sent direct from that island. In the better qualities, all these goods come from Almagro and Barcelona, and are sold at good prices."

Parcels not exceeding 7lbs. in weight are now received every week-day, at any post office in the United Kingdom, for transmission to Malta by Italy, at a charge of 2s. 10d. for 7lbs. Parcels are also forwarded by Gibraltar—the rates (prepaid) are 8d. for the first pound, and 6d. for each pound, or fraction of a pound additional, to 11lbs. The Parcel Post system is extended to the West Coast of Africa—the dimensions allowed are the same as those for the Inland Parcels Post. The rates of postage to Bathurst, Sierra Leone, Accra, Cape Coast Castle, Quittah, and Lagos, are 9d. for 1lb.; for each pound, or fraction of a pound additional, 9d. to 11lbs. A parcel to the Cameroons must not exceed 7lbs. in weight; the charge for not above 3lbs. is 3s. 2d., above 3lbs., and not more than 7lbs., is 8s. 8d. Parcels not exceeding 11lbs. are taken by the parcels mails to Beyrout by Port Said—the charge not exceeding 3lbs. is 1s. 11d., more than 3lbs., but not exceeding 7lbs., is 2s. 10d., more than 7lbs., but not exceeding 11lbs., is 3s. 9d. Parcel mails are also made up for transmission to French Colonies and Settlements, to Austrian and French Post Offices in Turkey, and to the Danish West and East Indies. The general regulations of the Foreign and Colonial Parcel Post are applicable to these places. The dimensions of parcels sent by post to Jamaica are extended to 3 feet 6 ins., greatest length, and 6 feet, greatest length, and girth combined. The charge for the first pound is 9d., and for each pound, or fraction of a pound additional, 9d. The weight of parcels sent from the United Kingdom to Spain is limited to 6½lbs., and those to Portugal, Maderia, and the Azores, to 7lbs.—Board of Trade Journal.

The Cotton Trade in India.

Lord Brassey recently delivered an address before the Bradford Chamber of Commerce. Speaking of trade, he expressed the opinion that, in consequence of the conditions of labour in India, the great dependency would never be able to compete with British manufacturers. His lordship added:—I will give you first the figures as to the growth of the cotton industry of India. Comparing 1886 and 1876, the mills and machinery had been doubled in the interval. The goods manufactured are chiefly of coarser descriptions, and the sale is mainly in India itself. The export trade to China is in yarns mainly. The establishment of local factories has not as yet produced any sensible effect on importation. In 1885 India imported 1,671,000,000 and exported only 53,000,000 yards of piece goods. Wide as is the difference in the daily rate of wages, the cost of labour in England and in India affords a remarkable illustration of the practical working of the great law of compensation, by which the cost of labour is more or less equalised all over the world. The investigations of the committee appointed by the Government of Bombay have shown that a mill in India contains about three times the number of hands, and pays approximately the same amount of wages, as a similar mill in England, yielding the same output, and producing the same quality of work. The superiority, in point of efficiency, of English labour is most conspicuous in the case of young hands. An experienced witness, an English manager, examined by the commission, stated that, while in Bombay a boy attends from 120 to 140 spindles, in England a girl of 18, who had been employed by the witness, had attended 512 spindles. Turning to the comparative condition of the workers in the Indian Factory Act, no maximum limits of the hours of labour are prescribed, and women can be worked as long as men. The Indian factories run from sunrise to sunset throughout the year, which gives 11½ hours per day in cold, and 14 hours in hot, weather. If the hours of labour are longer in India, the attendance is irregular, and the operatives often absent themselves for several days together for working visits into the agricultural districts, in which they hold small plots of land. The employment of women is much less considerable than with us. In Lancashire, of 423,000 workers employed in the cotton factories, 253,000 are females. In Bombay, of 50,000 operatives, 11,000 only are females. The earnings of the women in the Indian mills are higher than they could obtain out of doors; and we were much struck with the lavish display of gold ornaments among them. While it is said that employment in the factories is eagerly sought for, witnesses, appearing for the workmen, informed the Commission that the mill hands in Bombay complain of the long hours of labour and the want of a periodical day's rest. The Commission strongly recommended that some limitation should be put on the hours for women and children. This examination of the labour statistics of Bombay should be reassuring to those who take despondent views of the industrial situation generally in this country. When a comparison is made between the wages and hours of labour in England and on the Continent, it is difficult to resist the conviction that where we are losing ground it is largely due to the greater cost of labour.

Silky Appearance given to Vegetable Fibres.

Amongst many methods in use for the manipulation of fibres in order to render them more "taking" with the buying public, one has been recently discovered, by the carrying out of which, cotton, linen, hemp, jute, etc., are said to bear a strong resemblance to silk. The process, according to the *Moniteur de la Teinture*, is as follows:—The vegetable fibres, to whichever class they may belong, are first of all treated for four hours in a bath of caustic soda at 12° B., the temperature being kept at 175° F., by which treatment the gums and resins are quite destroyed, leaving the fibres of a slightly yellow colour, which is easily removed by a lukewarm (85°) solution of sulphuric acid, at 60° B. The material is next well washed until it does not redden litmus paper, and is then subjected to a solution of chloride sodium at 7° B. The bleaching process being now completed, the fibres are dried, and are next placed in a bath of

glucose or sugar, at 8° B., for four or five hours, after which they are again dried, and then placed in a mixture of sulphuric and nitric acid, which will change the sugar into nitro saccharose, and the cellulose into trinitro-cellulose. This treatment should be followed by extraction, then by a fresh soap bath and by another-rinsing. Next, the material should be placed in a bath of sumac at 85°, or of some other material that will impregnate the fibres with tannin, and this is to be followed by a cold solution of double tartrate of antimony and potash, which solution should contain about 30 per cent. of the weight of the material. The fibres prepared in this way can be used either mixed with some other fibre or alone, but, if they are mixed, they should be softened with either glycerine or olive oil.

Blue on Mixed Goods.

The *Moniteur de la Teinture* says:—Cotton and wool in mixed goods should be dyed in separate operations. The fabric must be thoroughly scoured and well rinsed—the dye-vats should be of wood, and the goods must not be permitted to stand during the process of dyeing. *Cotton*.—For dyeing the cotton, two baths are necessary. For 100 lbs. of goods, the first bath consists of:—Water, 250 gallons; tartaric acid, 5 lbs.; tin salts, 22 lbs.; nitrate of iron, 55°, 100 lbs. Immerse the goods, work cold for fifteen minutes and rinse with running water. The iron bath can be more diluted. After rinsing, the goods are given a second bath made as follows:—Water, 250 gallons; yellow prussiate of potash, 2½ lbs. The goods are worked ten minutes, then raised, and 4½ lbs. of oil of vitriol added. They are then entered again and worked for from twenty to twenty-five minutes, raised and washed in running water. *Wool*.—The bath is prepared by adding a small quantity of sulphuric acid, of common salt, and of indigo carmine. A piece of goods to be coloured a light shade is worked in this bath for from twenty to thirty minutes, at 125-140° F. Then, when the bath is in good working order, for every 100 lbs. of mixed goods, add 2½ lbs. of salts and 4½ lbs. of oil of vitriol. The goods are entered and the temperature is raised from 140° F. to 160° F., and indigo extract is added, little by little, until the shade is reached. The goods are then washed carefully.

Trade at the Cape of Good Hope.

It may interest many of our readers, who are not cognisant of the fact, to learn that Sir Charles Mills, agent general for the Cape of Good Hope, gives publicity to the following circular issued by the Mayor of Uttenhage, in the hope that what it contains may induce manufacturers and capitalists to establish factories in the colony. At a meeting of the Town Council of Uttenhage, the following resolution was passed:—That this council, as an inducement to manufacturers or capitalists to establish a permanent woollen factory or factories, at or near this town, is prepared to grant a site for the necessary buildings, with sufficient water for manufacturing purposes, for a period of ten years, free of rent and other charges. The Colonial Government offers a bonus of £1,000 for the first 10,000 yards of cloth, to be manufactured by machinery in the colony, entirely of colonial wool grown in the colony; and £100 for the first 100 pairs of socks and 100 pairs of stockings, to be manufactured by machinery in one day in the colony, of wool—the produce of the colony. The customs duty on woollen fabrics imported into the colony is 15 per cent. In addition to that, however, the colonial manufacturer would have the advantage of purchasing raw material on the spot, and save all freights connected with the importing into the colony. The whole of these considerations would collectively amount to over 50 per cent. in favour of the colonial manufacturer.

The Japanese Government have just added a commercial museum to the commercial school at Tokio, with the object of exhibiting to Japanese importers foreign products in such a manner as to awaken their interest and study. The commercial school at Tokio has made considerable progress and counts 500 pupils, who are educated to be the future merchants of Japan, and the professors destined to impart commercial education in similar schools later on.



ORIGINAL DESIGNS.

On our first plate, we give a design for a Tapestry Table Cover, which is drawn a little under proper scale. It is intended to be produced in a six and a half inch border and body. A very good effect may be obtained with this design by the use of four colours.

Our second contains a pattern for a Linen Damask Table Cover, it has been drawn by Mr. C. W. Sandiforth, 103, Race-common Road, Barnsley.

On our third plate is a design for a Toilet Cover.

MONTHLY TRADE REPORTS.

Wool.—The markets have been characterised by a firmer tone for most descriptions of wools, the animated aspect of the sales in London having had an effect upon trade in the country. Stocks generally for the time of the year are not heavy, and this, coupled with the above fact, has made sellers harder to deal with. This applies to the English and Scotch as well as to the Irish districts. The yarn trade has only been quiet, the business passing being of a slow character, and orders small in quantity. But with the firmness in the raw material spinners are sanguine of procuring more remunerative prices. In knitting, hosiery and coating yarns, an improvement has taken place, the demand having been good. In the piece branch, there is little new to report, a moderate business having been done, mostly for the home trade. Coatings for America have had an improved demand. Prices generally are cut very fine.

Cotton.—At the close of the year, spinners were mostly at work on orders to last some weeks, and they have, therefore, not been very eager for new business, in consequence, the sales of yarns have been rather below the average. Still, many inquiries have been made, but, where orders have been placed, extreme prices have ruled, and, unless a quotable advance has been given, spinners have preferred to run a little longer on orders in hand. The cloth branches, with the exception of sales to India, China, and the East generally, have been quiet, and prices have had a slightly downward tendency. To the above countries, the sales of shirtings, dhooties, jacconets, and such like cloths have been above an average.

Woollen.—The upward tendency of prices at the London sales of wool has had a cheerful effect upon the woollen trade. At the commencement of last month, things were rather quieter than for some time past, but, towards the close, there was a more cheerful feeling apparent, and, at the end, buyers had generally to give firmer rates in placing orders. The demand for the better classes of worsteds and woollens has been good. fancy coloured fabrics meeting with most favour, whilst plain, corkscrew, and such like, worsteds have had a fair inquiry. Tweeds, chevots, and similar classes of woollens in fancy designs and colourings have also met with much favour, both in the finer qualities and also in the lower makes for the ready-made clothing trade. On the whole, the outlook for this department of trade is bright for the immediate future.

Lace.—This branch of industry is anything but cheerful, and although in certain classes of goods a far larger number of orders have been given, still they have been at such prices that manufacturers are in a rather despondent state in consequence. The competition in all branches is still very keen, and where there is any prospect of making the lace trade pay, it is in the Ayrshire district, where the manufacturers have an advantage in the matter of cheap production.

Linen.—On the whole, there has been an improved feeling pervaded the markets, although the volume of trade, either for home or abroad, has not been appreciably larger during the past month. The principal demand has been for domestic cloths of various kinds, and for these fair orders have been taken. The flax trade is much the same as it was at the close of the year, there being little new to chronicle. The jute branches have shown a want of activity both as regards yarns and cloth, but prices have not altered quotably.

Bradford Technical College.

Sir Henry Mitchell, a gentleman so well-known for the active part he takes in trade affairs, especially in matters relating to Technical Instruction, has promised the sum of £21 to be given in prizes to the students of the above College. The competition is to be open to all whose names appear on the Register of the College for the present and the next terms. As the prizes are offered by Sir Henry for the purpose of encouraging the study of Design and Colour, a knowledge of the arrangement and harmony of colour will be prominent factors in the competition. The awards will be made by three competent judges, two of whom will be elected by the competing candidates themselves, and one by the Donor. The following prizes will be given:—(1.) Two of the value of £4 and £2 for studies of Plant Form, and the Best Set of Three Designs from the same, suitable for Woven Dress Fabrics in All-wool or Mixed Goods. (2.) Two of the value of £3 and £2 for Working out a Design on Point Paper, with full particulars for the production of the fabric. (3.) Two of the value of £2 10s. and £1 10s. for a Set of Six Designs for Printing on All-Wool or Mixed Dress Fabrics; Variety of style in the Designs will be taken into account in making the awards. (4.) Two of the value of £2 and £1 for a Set of Twelve Designs for Plaids or Checks, showing the greatest variety of design and the best combination of colours. (5.) Two of the value of £2 and £1 for the Best Pattern or Shade Card, arranged from samples of fabrics supplied to the candidate. Prizes in Nos. 1 and 2 competitions may be taken by the same candidate, who would be awarded a certificate of honour should he gain the first place in any of the other competitions, but he would not be awarded prizes except as above stated. There is no doubt that this offer will have a most beneficial influence on the students of the school, and through them on the character of the goods produced in the neighbourhood, and we feel sure that Sir Henry's example is one that may be imitated with advantage by many gentlemen in other manufacturing centres.

Exhibition of Textile Fabrics at the Yorkshire College.

The authorities of the South Kensington Museum have lent to the Yorkshire College a number of specimens of textile fabrics of various dates, representing different nationalities. The collection will be on view for some weeks at least, and it is probable that when it is withdrawn its place will be supplied by other objects of interest from the same source. Thus it is hoped that this may be the beginning of what may ultimately turn out to be a permanent exhibition in connection with the Art Department of the College. The present collection, which has been arranged in the Textile Museum, will be of considerable value to those engaged in the textile industries of the district, who, whether as manufacturers, designers, or colourists, will be able to learn many a lesson from an inspection of the actual work of men who lived in another age and in other lands. The twenty-five cases exhibited consist mainly of Italian textiles, mostly belonging to the period extending from the fourteenth to the seventeenth century, but there are also rich specimens of Turkish, Persian, and other manufactures, in the form of damasks, tapestries, plushes, velvets, and similar fabrics.

The Deeds of Arrangement Act came into operation on the 1st January, 1888. Its principal object is to secure the registration of every deed of arrangement, as defined by section 4, made by a debtor for the liquidation of his affairs. An important feature of the Act is a provision that failure to register a deed of arrangement within seven clear days after the first execution thereof by the debtor, or any creditor, shall render such deed void. The mode of registration of a deed is analogous to the registration of a bill of sale given by way of security for the payment of money, and the Registrar of Bills of Sale is the registrar for the purposes of the Act. In England, the office for registration is the Bills of Sale Department of the Central Office of the Supreme Court of Judicature; and, subject to the provisions of the said Act, and to any rules made thereunder, any person is entitled at all reasonable times to search the registers on payment of one shilling, or such other fee as may be prescribed.—*Board of Trade Journal.*



London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1878.



Philadelphia, 1876.



Dublin, 1865.



Leeds, 1875.



HEATS THE FEED WATER WITH THE WASTE HEAT TO A TEMPERATURE CONSIDERABLY ABOVE BOILING.

CONTRIBUTES GREATLY TO THE DURABILITY OF BOILERS.

Can be applied without stoppage of works. Has been in operation to every description of Boiler for upwards of 35 years.

IMPROVEMENTS have just been MADE in the CONSTRUCTION and DETAILS of the MACHINE.

The Pipes are cast VERTICALLY and in DRY SAND MOULDS.

THESE ECONOMISERS ARE NOW CONSTRUCTED FOR EXTREME HIGH PRESSURES.

PROVISION MADE AGAINST INCRUSTATION AND MUDDY WATER.

1887. New Patents. 1887.

No fewer than **SIXTEEN PRIZE MEDALS** have been gained by the Economiser, the highest award being obtained in every case for sound workmanship and superiority of design.

Original Inventors, Patentees, and Sole Makers,

EDWARD GREEN & SON,

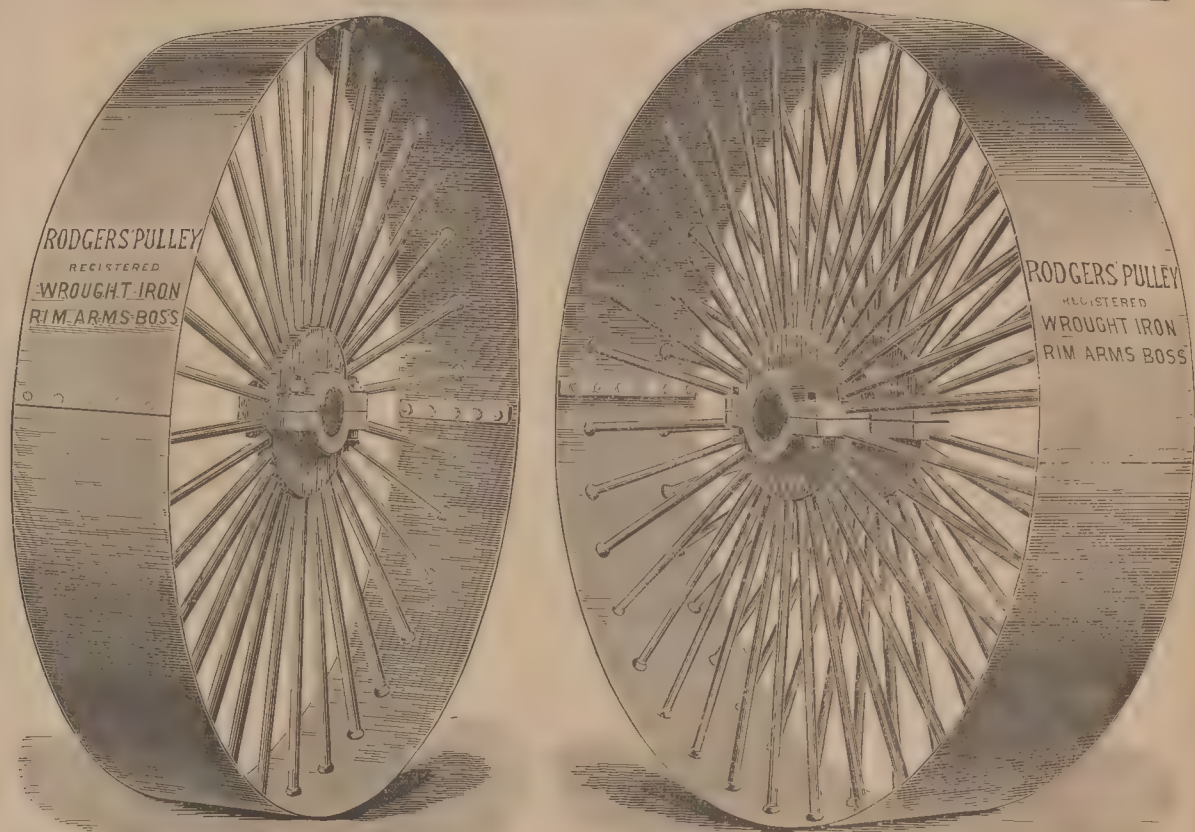
ST. ANN'S SQUARE, MANCHESTER.

WORKS:—WAKEFIELD, YORKSHIRE.

February 12th, 1888.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

HIGHEST AWARD AT THE INTERNATIONAL INVENTIONS' EXHIBITION.
RODGERS' PULLEYS,
REGISTERED.
Wrought Iron THROUGHOUT, RIM, ARMS and BOSS.



The **ONLY** Safe Pulley for High Speeds or Great Power.

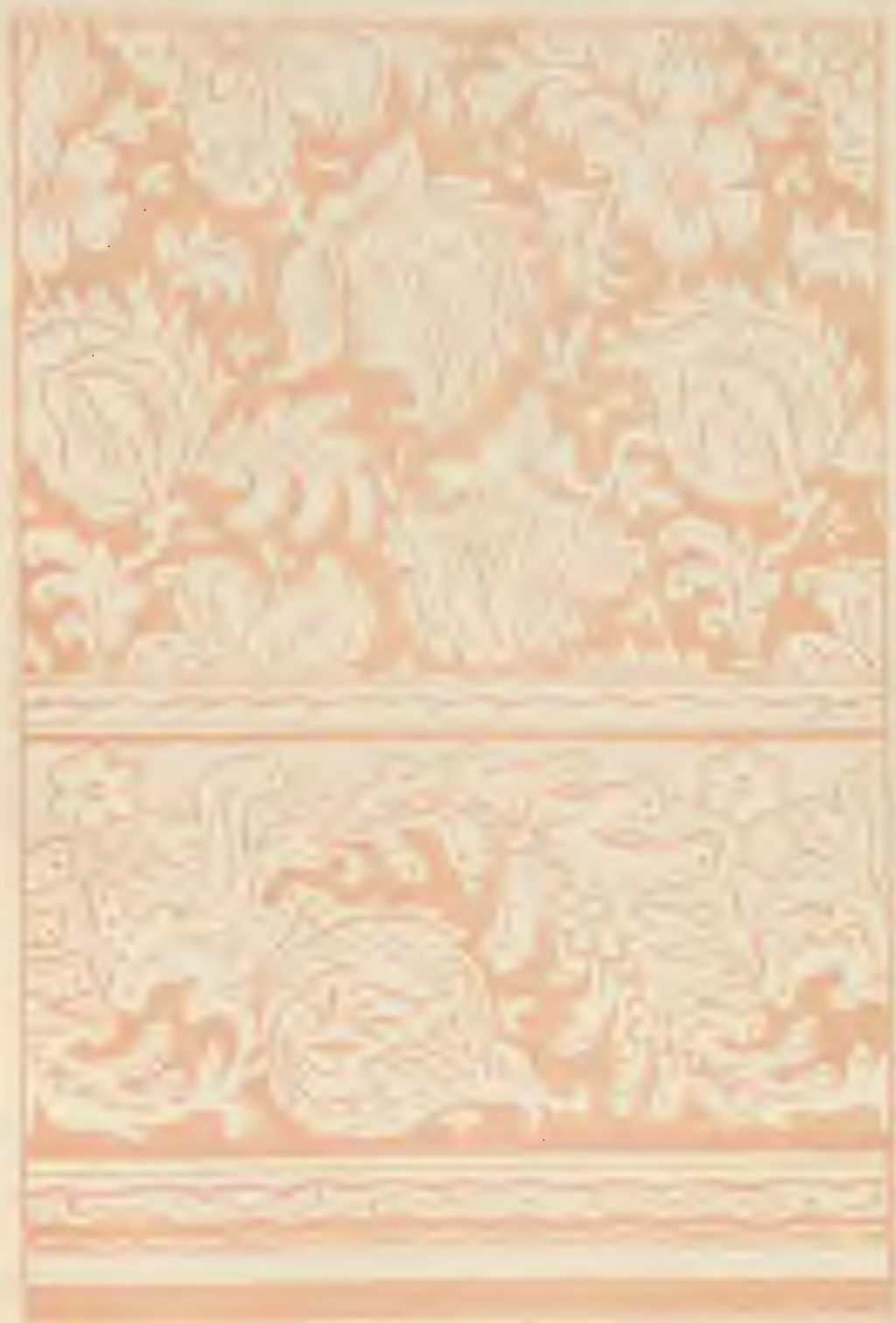
SPLIT OR SOLID. ALL SIZES FROM 6 INCHES UP TO 24 FEET DIAMETER.

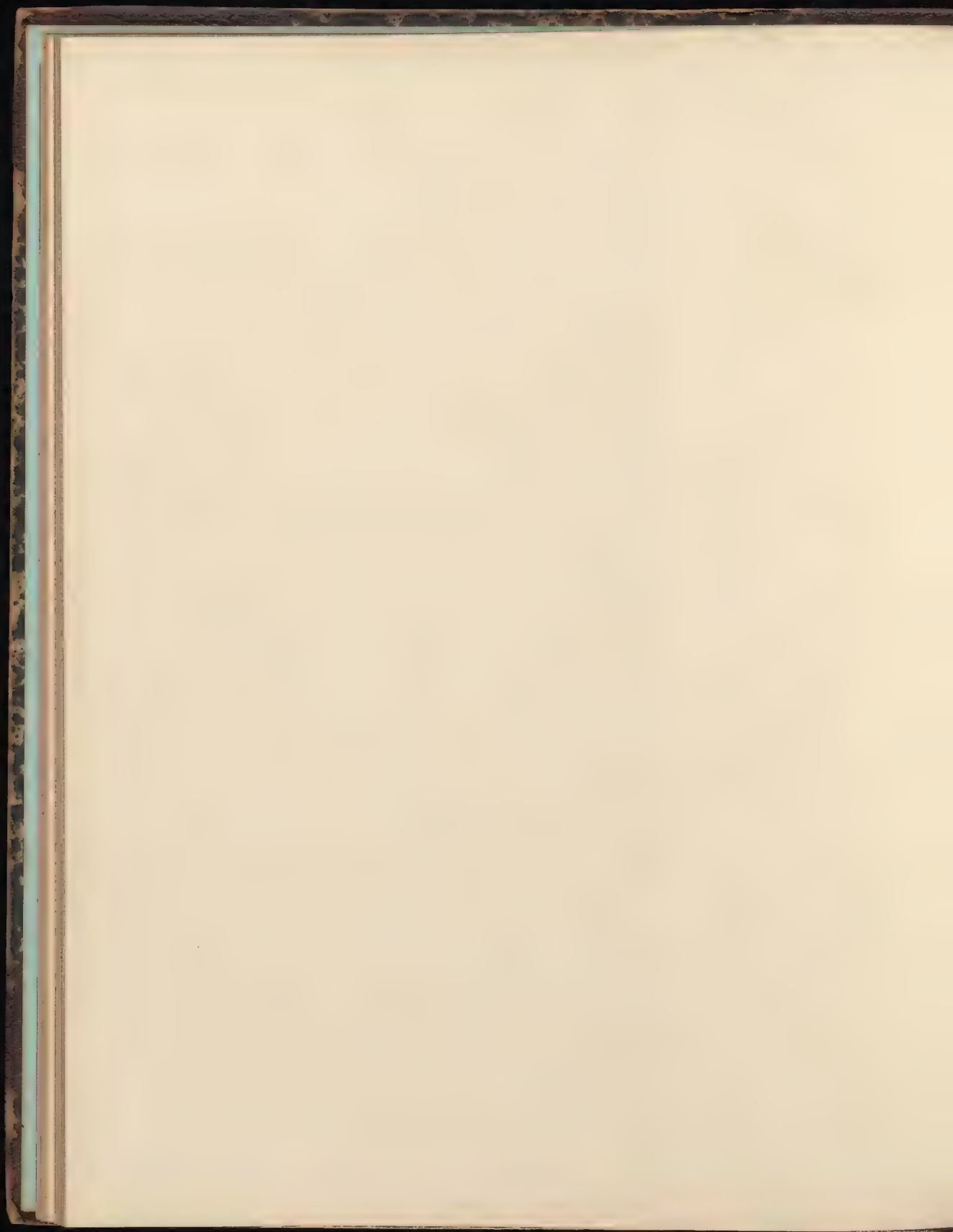
Over 60,000 in use.

SOLE MAKERS—

HUDSWELL, CLARKE & Co.
RAILWAY FOUNDRY,
LEEDS, ENGLAND.

Used exclusively for Driving the Electric Light at the late Fisheries, Health, Inventions & Colonial Exhibitions.



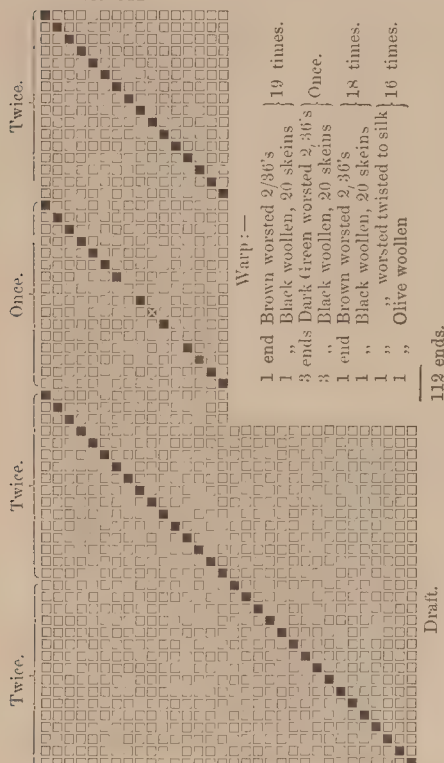




FASHIONABLE DESIGNS.

Trousering.

No. 511.



Warp:—

- | | | |
|--------|-----------------------------|-----------|
| 1 end | Brown worsted 2/36's | 19 times. |
| 1 " | Black woollen, 20 skeins | Once. |
| 3 ends | Dark (green worsted 2/36's) | |
| 3 " | Black woollen, 20 skeins | 18 times. |
| 1 end | Brown worsted 2/36's | |
| 1 " | Black woollen, 20 skeins | 16 times. |
| 1 " | worsted twisted to silk | |
| 1 " | Olive woollen | |

112 ends.

Woven all Brown worsted 2/36's.

Three face ends in this head.

Draft.

6,720 ends in warp; 105 ends per inch; 50 picks per inch; 32 healds; 17½ slay; 6 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. Weight 22 ozs.

Plan.

Mantle Cloth.

Light Grey warp, 9 skeins cheviot.

" " weft, 9 " "

1,344 ends in warp; 21 ends per inch; 21 picks per inch; 10½ slay; 2 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. Cheviot finish. Weight 20 ozs.

Straight Draft

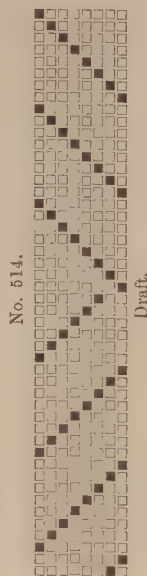
Suitsing.

Warp:—

- | | |
|--------|--------------------------------|
| 1 end | Crimson worsted 2/48's. |
| 5 ends | Dark Olive woollen, 22 skeins. |
| 6 " | Black woollen, 22 skeins. |

Woven all Black, 22 skeins woollen.

Plan.



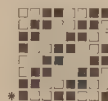
No. 514.

Draft.

Trousering.

Warp:—

- | | | |
|--------|----------------------|----------|
| 3 ends | Dark Blue, 16 skeins | 3 times. |
| 1 end | Crimson | |
| 4 ends | Olive | |
| 3 " | Dark Blue | 3 times. |
| 1 end | Tan | |
| 4 ends | Olive | |



Plan.

Woven all White weft, 16 skeins.

2,304 ends in warp; 36 ends per inch; 32 picks per inch; 8 healds; 9's slay; 4 ends in a reed; 64 inches wide in the loom; 56 inches wide when finished. Finish clear. Weight 18 ozs.

New Patterns for Spring and Summer Seasons 1889.

The new patterns in worsted, woollen, and mixed cloths, for the spring and summer seasons of 1889, are now on hand. In many respects they are an advance upon former collections of fabrics that have been claiming attention for the past year, especially those having effects in fancy yarns. The curled effects that have been in such favour are almost absent, and those fabrics that do contain yarns of this class, have them in a very subdued form. Various styles of knopped yarns are being adopted in their places, but even these are used more sparingly than formerly. In dress and mantle goods they appear in many cases, their effect being heightened by varied colouring, whilst for coatings, &c., for gentlemen's wear, they are used but little compared with the past two or three seasons. In costume cloths, there is not much novelty to note, but the tendency seems to be for those of a soft woolly nature. The designs and colourings of which are numerous and effective. In worsteds, the leading run is likely to be in the finer classes of goods, and this is hardly to be wondered at, when it is taken into account that the retail prices of the finer and medium classes do not show a great margin of difference. In trouserings, the tendency in design is to diagonal stripes, both in plain and fancy styles, the latter having their general effect heightened by the usual introduction of silk. In coatings and plain shades, designers seem to have, during former seasons, taxed themselves to the uttermost, for little is to be found absolutely novel, but in the fancy styles, many new and pleasing patterns in checks and stripes, in fresh combinations of colours are before us, and those ought to meet the wishes of the public. Worsteds for export are perhaps the best examples as, generally, the patterns are light in weight and colour, and give greater scope for the art of the designer. In woollens, stripe effects are prominent for trouserings and also in many cases for suitsings, and generally the texture and finish, especially of the medium and lower qualities, are similar to those of cheviot fabrics, although there are many exceptions to be noticed; the smoother kinds of cloth, such as receive a "draw" finish, do not occupy a very prominent position. In suitsings and coatings, checks take the lead, being from medium to large sized squares and, in some cases, a large overcheck is manipulated in such a manner that undue prominence is not given to the smaller checks. As in former seasons, we can supply manufacturers and designers with selections of patterns for 1889 at £2 per 100 samples. In ordering, to ensure a good selection, a few cuttings of cloth should be sent to enable us to judge of the class manufacturers wish to produce.

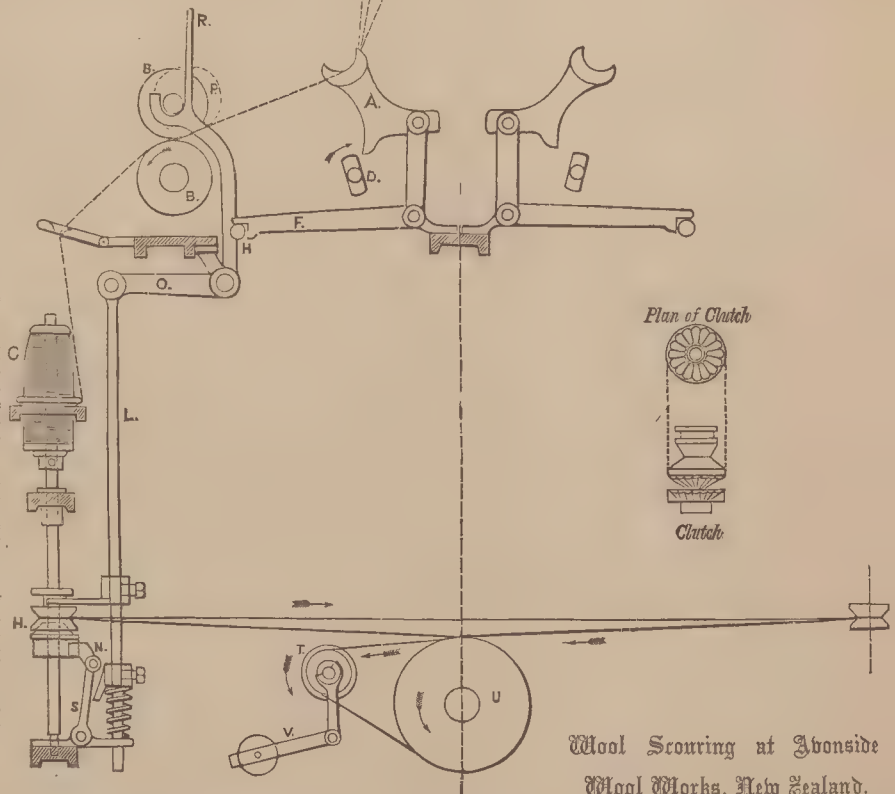
The artists of the Gobelins tapestry manufactory, which is a French State institution, are striking against the retention on the rolls of men who have become superannuated, destroying the prospects of advancement for the youthful members of the staff. If the petitions are successful one of the first men to be set aside will be the famous French chemist and dyer, M. Chevreul, whose centenary was celebrated by all France not long ago, and who has been at the Gobelins since 1826.

MACHINERY, &C.

Holden's Patent Improved Stop Motion Twisting Frame.

To producers of yarns and cloths of various kinds, the value of having efficient machinery cannot be over-estimated, and those firms who, from time to time, either change or add to their mechanisms are generally the ones who make their way in the world. Many examples of this could be placed before our readers, but they, as a body, know that the above is perfectly correct, as, in these days of close competition, the producer who relies upon old and, in many cases, obsolete apparatus has sooner or later to go to the wall, whatever capital he may have at command. From the numerous descriptions of improved mechanisms which we have given, much good has accrued to producers of textiles, and we, therefore, put before our readers the merits of a patent stop motion twisting frame, having numerous points of advantage, which will be appreciated by users of this class of machinery. The frame is being made by Mr. G. H. Holden, Carr Street, Blackfriars Street, Manchester. Recently, many improvements have been made, the object of which has been to facilitate the working of it, in order to secure a higher rate of speed, an improved yarn, and a reduction in waste. The machine is well known by spinners, and those who have seen the former frames at work will welcome the additional improvements in the patent of Mr. G. H. Holden, as they place it in the front rank of twisting apparatus. In construction it is simple. The stopping of the spindle and corresponding roller is effected instantly, and the liability to slippage is reduced to a minimum. By a patented thread guide, the friction on the yarn is reduced, and a more equal tension given to each thread. There is also an arrangement for driving two spindles with one band, with compensating lever and pulley for keeping the tension of the band even. This arrangement can be understood by reference to the accompanying sketch. A represents the thread guide, under which the thread passes on its way through the rollers BB to the bobbin C. When one of the ends breaks on a bobbin, or it runs empty in the creel, the thread guide A comes in contact with the wiper shaft D, and raises the lever F, lifting it off the fixed peg H; immediately this is liberated, the spiral spring on the lower part of rod L presses upward, which rod answers a three-fold purpose in rising, lifting the clutch out of gear at H, and bringing a brake lever, marked S, in contact with the lower part of the wave at N, instantly stopping the spindle. It also gives motion to the cranked lever O, and draws the top roller backward, as shown by dotted line P, thus breaking the contact between top and bottom roller, and stopping the thread. When the attendant has pieced up the broken end, the projecting handle R is drawn forward, allowing the lever F to drop again on to the fixed pin, and, at the same time, the break at N is released, and the clutch is again brought into gear at H. Special attention is called to the thread guide which the recent experience and observation of Mr. Holden have led him to adopt. This takes the place of the usual perpendicular drop wire which always hangs vertically on the thread, objections to which have often been made by makers of soft and fluffy yarns with little twist, as in the worsted trade, the fluff having a tendency to gather around the eye of the ordinary detector wire and to choke it, extra waste being thus made, whilst an undue strain is put upon the yarns; the yarn also is robbed of that which should pass with it through the rollers, and be incorporated in the twist. These faults are guaranteed to be obviated by this thread guide,

which presents a broad surface under which the yarn passes, and as it hangs on a fulcrum, it is easily held up by the yarn without the rigidity connected with the ordinary drop wire, another advantage results—it gives a more even tension to each thread than can possibly be obtained with the perpendicular drop wire. The clutch on the front spindle, which is thrown in and out in the action of stopping and starting, is of peculiar construction, the tooth being so formed as to allow of its being put in gear, when running at a very high speed, without fear of breakage. As will be seen by the accompanying illustration, two spindles are driven by one band; U is the tin drum around which the band passes on to one spindle on each side of the frame and round the carrier pulley T, which is held by a compensating lever weighted so as to keep the band at an equal tension. Machines on this principle are being built by Mr. Holden on both the ring and flyer systems, and can be seen at his show rooms at address given above. We may add that these arrangements can be applied to existing machines, and, where necessary, an additional stop can be applied to the thread after it leaves the rollers. The machines are equally adapted for cotton, worsted, silk and such like light yarns, and special machines of larger sizes are made for flax, jute, and hemp yarns. A visit to Mr. Holden's show rooms will repay those interested.



Wool Scouring at Avonside Wool Works, New Zealand.

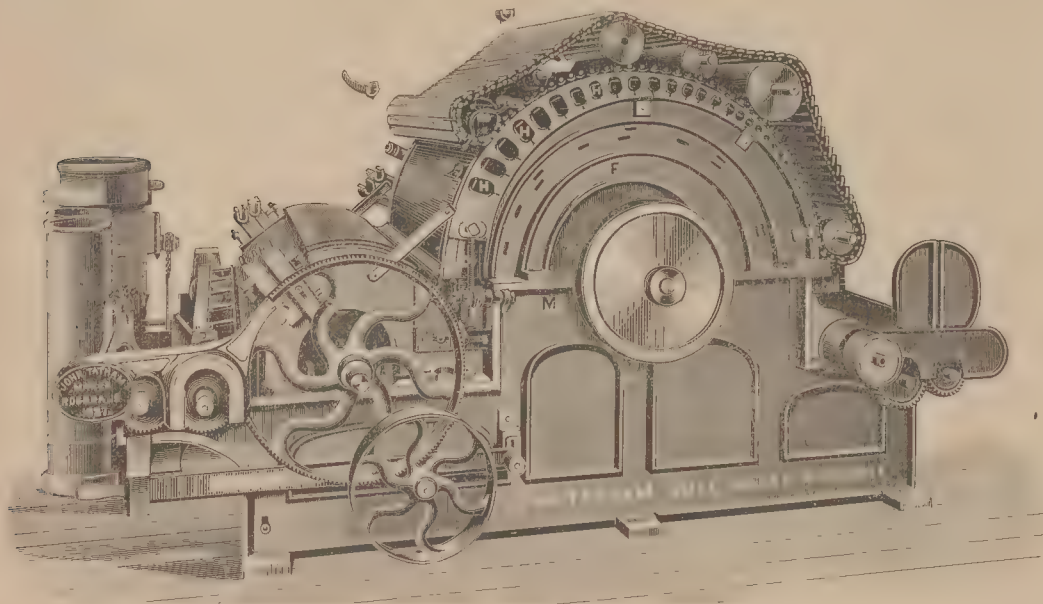
The following is taken from the *Lyttleton Times* (New Zealand), which speaks well of the capabilities of the wool scouring machinery made by Mr. J. Petrie, junior, of Rochdale. "The wool scouring industry, which for some years had been in a stagnant condition, has, during the last year or two, greatly increased in importance, and, at the present time, there are somewhere about a score of establishments, on various scales, in Christchurch and the vicinity, where wool scouring, generally in conjunction with fellmongering, is carried on. Of these, the works of Mr. Joseph Murgatroyd, at Avonside, have just been rendered one of the most complete in New Zealand by the introduction of a patent steam scouring plant, with the latest improvements, by the celebrated maker, Mr. J. Petrie, junior, Rochdale, England. Mr. Murgatroyd, junior, made a trip home with the main

object of obtaining the best machine that could be had, and after seeing all the most approved inventions in actual operation, selected Petrie's; and the work it is doing, now that it is fitted up at Avonside, justifies his choice. The scouring machine consists of two tanks, each about 15 feet long. The first contains water heated to from 90 degrees to 100 degrees, according to the nature of the wool to be scoured, and with a proper proportion of soap added. Into this the wool is fed without any previous soaking, and is passed through by five forks worked by eccentric action. The last of the forks delivers the wool, which by this time is thoroughly soaked by the soap and water, on an appliance which raises it to a pair of rollers, through which it passes into the next tank, the liquid, and most of the dirt, being pressed out by the rollers and flowing back into the hot water tank. The second tank contains cold water, and the wool being passed through this by five forks, as in the first tank, is washed thoroughly clean. It passes through a set of rollers—one of which is covered with woollen cloth so tightly that it is as hard as wood—and is finally removed by a revolving fan, and delivered in a snow-white heap at the opposite end of the machine to which it entered. This scoured wool comes off the rollers so free of water that a very few hours in the open air in fine weather are sufficient to dry it thoroughly for packing. The wool passes through the machine at the rate of about two bales an hour, and the great advantage of scouring by this rapid system is that the wool is thoroughly cleansed without the "nature" being extracted from it, as is the case with prolonged soaking in hot water. * * * * The fellmongery department has facilities for working six or seven hundred skins a day. Mr. Murgatroyd and his sons, who are associated with him in the business, are masters of their trade, having been engaged in it all their lives—not having "picked it up," as is the case with the majority of colonial scourers. The reputation of his brand, "Murgatroyd, N.Z.," is established, and will be enhanced with the improved appliances now at his command.

also make patent enamelled traces for horses, they are of great strength and durability, and no amount of exposure to rain or of absolute immersion in water will damage the fabric or soften it. It regains its brightness by being wiped dry, a fact which manufacturers might notice with advantage. They are also makers of a patent belting fastener which effectually supersedes lacing, besides which it is more readily applied, and does not cause the injury to the belting which often results from lacing. The office of the company is at 20, Rook Street, Manchester, where inquiries will be satisfactorily answered.

Catham's Revolving Flat Carding Engine.

A new revolving flat carding engine has recently been put upon the market by Mr. John Catham, Moss Lane Works, Rochdale, which is certainly a step in the right direction. The revolving flat card has, for some time past, occupied the attention of spinners and manufacturers, which assertion is fully borne out by the number of inventions patented from time to time, all more or less tending to the further development of this class of mechanism, and to bringing it to a higher state of usefulness. Numerous devices have been utilised by the different firms of machinists in this country, but, perhaps, no complete machine has more points of advantage to recommend it than the one now under notice, and these advantages seem to us likely to claim the earnest attention of users of carding engines. The machines are firm, perfectly true, and can easily be adjusted by any ordinary workman. From the illustrations, the leading features of the improved mechanism may be gleaned. In Fig. 1, F is a fixed bend, which is attached to the framing of the engine M. The outer edge of this bend is not concentric with cylinder shaft, but is so formed that the curve is practically part of a



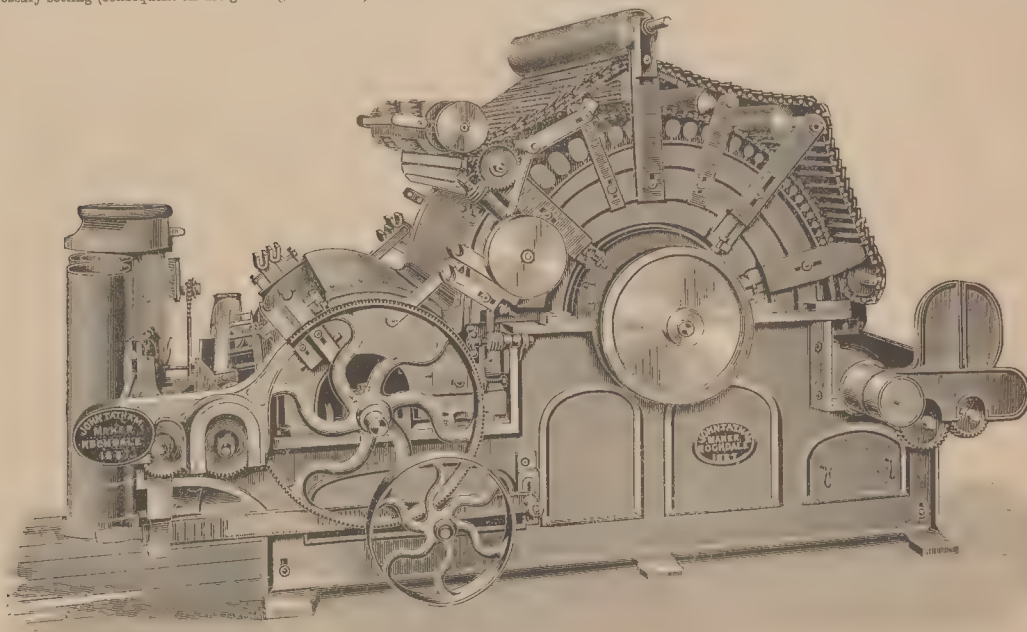
The Rossendale Belting Co.'s Patent Anti-Friction Belts.

During recent years, many varieties of materials have been made use of as substitutes for leather belting, and perhaps none of them have proved so successful as the patent solid hair belting manufactured by the Rossendale Belting Co., and, therefore, a few particulars regarding this material may not be out of place in our Journal. The chief advantage which this belting possesses over others of a similar nature is in its non-liability to fray at the edges under the action of the strap fork. This has been a matter of careful consideration by the company, and the means by which it has been successfully accomplished have formed the subject of patents, not only in the United Kingdom but also, in France, Belgium, and the United States. There are other advantages besides that of the anti-friction edge, as, for instance, any length of belt may be made, and it therefore requires but one joining. It is not affected by heat, water, steam, or acids. It runs perfectly smooth and straight, and possesses great biting power on the drum or pulley, and in point of strength and general utility it is unsurpassable. The company make cotton duck beltings specially for use in hot climates. These are made with the patent anti-friction edge, and are of superior quality. They

spiral, and, if continued, would reach the centre. Thus, an examination of the engraving illustrates that the spiral curve is, on one side, nearer the centre, than it is on the other side. Upon this spiral surface of bend F rests the flat supporting arrangement H. This arrangement is not merely a strip or band of metal, but is strongly made in cast iron, milled in its outside and inside edges by special milling apparatus, and is constructed with its inner surface of the corresponding curve to that of the spiral bend, but with its outer surface of a circle which is concentric with the cylinder. By this means, a perfectly true and even course is provided for the flats. This is certainly the best and most perfect shape to sustain the flats. The arrangement for carrying the flats has a number of holes, or slots, which increase in size towards its thick end. From the bottom side of each of these holes or slots, niches or saw gates are made or sawn, so that it readily and easily accommodates itself to any change in position when setting. Attached to this flat course, an adjustment is provided for regulating the same, by which means the flats are brought nearer or further from the cylinder, and the spiral curve is so proportioned that the adjustment can be made to any desired accuracy. The setting and adjusting arrangement is fixed in a most accessible and convenient position, and, being locked, cannot be tampered with except by the man in authority. By duly proportioning the setting, the delicate range of action is obtained, and all the flats are set at one operation on each side; this is very different from most flat carding engines,

which have sometimes to be set at four or five places, and, in some cases, with steel bands or strips of varying thickness, requiring great care and trouble, whereas, in this machine, one simple operation is all that is required. An index pointer is attached to mark the exact position on each side of the carding engine. The strong point of recommendation in this simple and ingeniously-contrived flat engine is that the flat course has a firm bearing throughout its entire length on the "fixed bend" attached to the carding engine sides. The flats, therefore, have a direct thrust or bearing on the best possible surface, and are carried and sustained by a rigid bearing. Not only so, but this arrangement is prevented from having any circumferential motion, and from its shape vibration in a card-room will not affect its lateral position. The simplicity of the means employed is also a matter of great importance, as is also the beautiful construction of the machine. The parts are cut automatically by milling tools, specially made, so that each carding engine, flat course flats, fixed bend, &c., are facsimiles of each other. As regards the adjustment of the "flat course" to the necessities of "carding," nothing could be simpler than the means employed, and so far as the necessary setting (consequent on the grinding of the wire) is concerned, this,

the material is brought into the right position to receive the downward pressure of the knives. The tray is of wood, and is lined on the top with linoleum, rubber, or other soft material—having longitudinal and transverse grooves to suit the knives and feed. Each upward movement of the screw draws the bolts out of the holes, and, when the screw reaches a certain height, its influence over the bolts ceases, and they are forced by the action of a spring into the next holes in the sides of the tray, which is thus held in the proper position to receive the next descent of the knives. A rack is attached to the side of the sliding tray with teeth the same length as the width of the pieces to be cut, and spaced so that the knife will register with the cuts in the linoleum cover of the table. This rack can be reversible or interchangeable, and made with two or more rows of different sized teeth, anyone of which can be used according to the sizes of the patterns to be cut. The machine, when in use, is secured to a suitable table by bolts through holes, or by clamps, or other similar means. In operation, a piece of cloth is placed on the table and clamped in place by the frame, and the knife and the cuts in the linoleum cover are so adjusted as to register at each stroke of the screw.



being done at one point only on each side, but little trouble is entailed on the overlooker, at the same time the operation is accomplished with perfection. The machine can be seen at Mr. Tatham's works, and spinners desirous of testing it will be afforded every facility, and can bring their own laps in order that they may work them on this important invention.

A Self-Feeding Machine for Cutting Samples of Fabrics.

Amongst the numerous improvements brought before those interested in various mechanical appliances for the saving of labour, pattern cutting machines ought to occupy a somewhat prominent position, as thousands of yards of material are cut up monthly, in this country alone, to be sent out as samples by manufacturers, merchants, clothiers, drapers, &c., &c., and when we consider the immense amount of hand labour employed in this occupation before the advent of the cutting machine, we are not astonished that many have turned their attention to the invention of an apparatus which should perform the work in a far more satisfactory manner than is possible by hand and at a greatly reduced cost. Mr. T. S. Sykes, of Liverpool, has been granted a patent for an invention of this class. The machine consists of a screw working downwards through a frame, to the lower end of this screw a block is attached, on the underside of which steel blades or knives are fixed—the position of these knives may be altered in order to regulate the length of the patterns to be cut. There is also a sliding tray which is moved forward by a spring, but its movement can be regulated by bolts shooting into holes or grooves in the sides of the tray—the distances between the holes regulating the width of the patterns, and by the sliding of this tray

The "Sunbeam" Electric Lamp.

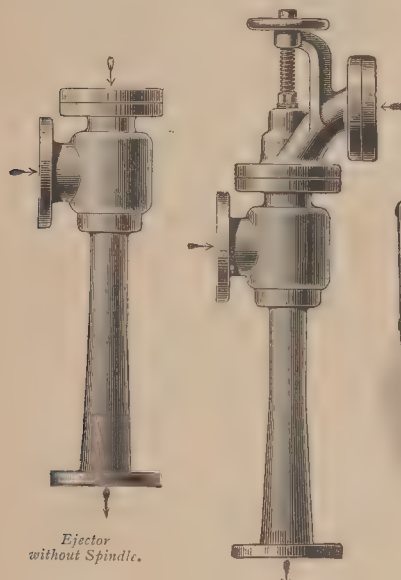
The whole of the inner courts of the recent Newcastle Exhibition were lighted by a new and very effective kind of incandescent lamp of great power. Heretofore, when a great amount of electric light has been required, the only alternative has been to group a large number of the usual incandescent lamps, or to adopt the Arc lamp. The latter seldom gives a really steady light, and requires constant attention to replenish the carbons, which are more or less rapidly consumed. The "Sunbeam Lamp" is made to give a light of from 200 to 1500 candle power, and takes only half the current required for the ordinary glow lamps grouped to give the same amount of light. The light is absolutely steady and requires no attention to keep it in order.



Those in the Newcastle Exhibition worked most satisfactorily, and without a single failure. We have seen these lamps at Mr. Jos. Edmondson's, 36, Sunbridge Road, Bradford, and they appear to us to be most effective, and eminently suitable for the lighting of large halls, large open areas, exhibitions, and large work-rooms, such as weaving and combing sheds; also for ceiling lights in rooms in private houses. The light is very soft and pleasant, and so much resembles direct sunlight that the name adopted by the makers, seems peculiarly appropriate.

Meldrum's Steam Jet Ejectors.

We have received from Mr. James Meldrum, 26, Half Street, Manchester, particulars of his Patent Steam Jet Ejectors, apparatus of which he is one of the leading makers in this country. These mechanisms are used in some of the branches of the textile trades, in which they are considered a necessity. In these appliances (illustrated below) the steam acts directly on the air to be moved, without the intervention of any steam engine or other machine. Having no moving parts, there is absolutely nothing to wear away, and no

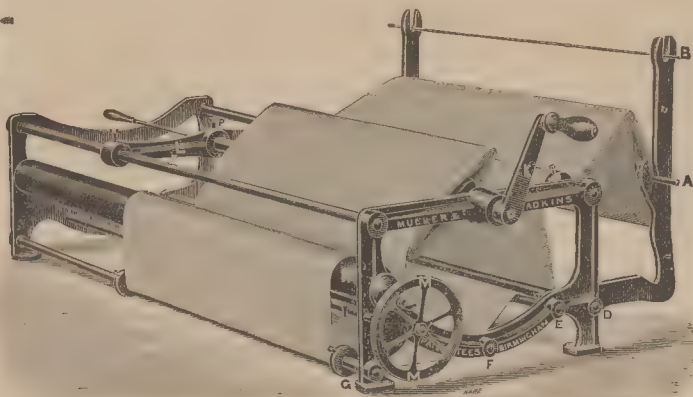


oil or other attention is required beyond that of keeping up the supply of steam. For many purposes, where a high vacuum is required, the steam jet is preferable to any other means. It is guaranteed that a vacuum of 25 inches mercury, or 29 feet of water, can be obtained by merely turning on a steam cock. Mr. Meldrum constructs ejectors for any degree of vacuum from the highest attainable down to the fraction of an inch of water. They should, however, always be designed for the specific conditions. For high vacuum, it is best to use the highest pressure of steam available, but, with ejectors specially made, a vacuum of 24 inches mercury can be obtained with a steam pressure of 25 lbs. per square inch. With 50 lbs. steam pressure, 26 inches mercury may be taken as the limit of vacuum attainable; with more pressure a higher vacuum may be obtained. The ejectors are also made to overcome a counter pressure as well as to maintain a vacuum, and can be provided with an automatic governor to keep a constant degree of vacuum or pressure. Where desired, a water or air cooler may be used to condense out the steam. For cases where the highest attainable vacuum is desired, without passing a considerable quantity of air, special apparatus can be supplied, giving upwards of 29 inches mercury with 40 lb. steam or less. To intending purchasers Mr. Meldrum will give full particulars and advice on the most suitable apparatus for any required purpose.

Muller's Cloth Measuring Machine.

There are numbers of machines of various kinds in the market for the measuring of different descriptions of textile goods, one of the latest and, perhaps, one of the simplest and most effective, is now being made by Mr. H. L. Muller, Mary Ann Street, Birmingham. It is adapted for the measuring of fabrics from the lightest and narrowest to the heaviest and broadest makes, the width and strength of the machine being such as to embrace all classes of goods. In the accompanying illustration, the machine is shown in the operations of unrolling, measuring, and re-rolling, at the same time, the act of unrolling, measuring, and re-rolling, being accomplished in a similar manner. The fabric to be measured is fixed upon the rod A, and from thence it is carried over and around the various rods, and wound up between the centres O and P. As the material passes over the roller H, the exact measurement is indicated upon the wheel M. The machine is operated by the handle K, by hand, by treadle, or by power, as required. The number of rods over which the fabric is passed can be increased or diminished according to the degree of tightness the stuff is required to be wound or wrapped, the arrangement being such that a firm grip of the cloth, and an even folding, or rolling, are maintained

throughout the piece. To the manufacturer, or merchant, this apparatus will be especially valuable, as the rolling, or boarding, combined with accurate measurement, can be done in a quick and effective manner, with great economy as regards the labour required for the process. It is guaranteed by the maker that one junior hand can work the machine, and can do as much in a given time, as would take several men when folding and measuring by hand, and this is accomplished without the possibility of error, as the apparatus always shows the exact length of cloth that has passed over the roller H. In checking invoices in a merchant's warehouse, the apparatus will be invaluable. When not required, the machine can be packed in a small compass. It is made in three sizes, to take goods up to 36 inches and 45 inches wide, the third and largest size being for carpets, druggets, and such like heavy fabrics. Mr. Muller will give full particulars and prices on application.



ODDS AND ENDS.

The movement for securing a wool market, or periodical sales of wool, at Hull continues to receive most influential support. Last month a circular was issued, signed by nearly 70 important wool buying and manufacturing firms in the West Riding of Yorkshire, which set forth the great advantages possessed by Hull over London and Liverpool in respect of proximity to the wool district, the very much lower rates of charges and carriage, and the fact that there is a regular line of steamers now running from Bombay to Hull. It is also pointed out that large quantities of Russian, German, Austrian, and Danish wool are imported into Hull by various steamship lines, and that it would be a great advantage if sales of East India wool could be combined with the other descriptions.

The Treasury have fixed the rate for the adjustment of accounts between the Imperial and Indian Governments, for the year 1888-9, at 1s. 5d. the rupee, as compared with 1s. 6d. for the current year. The rate for the issue of the dollar at Hong Kong, in the Straits Settlements, and on the China Station, for the first six months of the financial year 1888-9, has been fixed at 3s. 3d., and for the issue of the rupee in the colonies of Ceylon and Mauritius, and on the East India Station, at 1s. 5½d. for the same period. These rates are fixed for regulating the payments which would be paid in England in sterling. The Treasury, being anxious to attain a closer approximation of the fixed rates to the recent average value of silver in the London market, have decided that for the future fresh rates shall be assessed in each year, to come into force on the 1st October, and to last to the end of the financial year; while the rates coming into force on the 1st April will last until the end of September in each year.

According to *Kuhlow's Gazette*, the authorities of the Rhenish-Westphalian State Railway intend to reduce the freightage for piece goods exported to foreign countries over German harbours, from stations on their lines, to such an extent that the competition of the Belgian and Dutch harbours in the export of such goods will not press so hardly. The low rates for the Belgian and Dutch lines for these goods, namely 3-3 and 3-8 mark-pfennig respectively for the ton-kilometer (against 11 and 8 mark-pfennig for the ton-kilometer), give, when reckoned together with the German rates, comparatively much lower freightages than is the case with the German harbours. The new arrangement is to be this:—The freightage from Amsterdam to Essen will be adopted from Barmen to Essen, and the latter freight fixed for all stations situated nearer than Essen. For stations lying beyond Essen, a uniform rate will be adopted upon the basis of the freight from Bremen. The present freightage for piece goods from Amsterdam to Essen amounts to 1-76 mks per 100 kg.



PATENTS.

Applications for Letters Patent.

Automatic signal for picking and finishing machines. A. Bradsworth, Leicester.	2nd. Jan.	3
Apparatus used in manufacture of wood wool, &c. S. and T. Cooper, Manchester.	12th Jan.	496
Automatic sprinklers. T. Dutton, Manchester.	18th Jan.	784
Adjusting the axes of carding engine cylinders. G. and E. Manchester.	20th Jan.	877
Black liquid from aniline, nitro-benzine, and their derivatives for dyeing, &c. L. A. Groth, London.	30th Dec.	17,925
Bleaching and disinfecting liquor. E. Hermite, E. J. Paterson, and C. F. Cooper, London.	31st Dec.	17,969
Beating, breaking and washing engine for rags, &c. G. Griffiths, London.	10th Jan.	427
Boiling, or bleaching, and washing textile fabrics and apparatus therefor. A. McNab, Glasgow.	23rd Jan.	988
Circular knitting machines. E. W. Lee and G. E. Burnham, London.	30th Dec.	17,955
Calendering or finishing woven fabrics. W. Robertson and J. G. Orchar, Glasgow.	31st Dec.	17,977
Circular knitting machines. W. H. Dorman, Stafford.	4th Jan.	123
Caps and spindles of cap spinning machinery. J. Smith, Bradford.	6th Jan.	235
Construction or arrangement of shuttles and welt carrying bobbins or quills to be carried therewith, applicable to certain classes of looms. H. and T. Burgess, and C. Clay, Manchester.	10th Jan.	387
Cut and uncut pile carpets, &c. T. Tempest-Radford, and E. J. Morton London.	11th Jan.	446
Combing wool, &c. G. Smith, Bradford.	18th Jan.	777
Cloth steaming machines. A. Struthers, Glasgow.	19th Jan.	859
Carpets—weaving and appliances therefor. W. C. Gray and W. Tannabill, Glasgow.	20th Jan.	902
Cleansing blankets of calico-printing machines. E. J. Jones, Glasgow.	23rd Jan.	999
Combing and carding machines. F. W. Durham, London.	26th Jan.	1,217
Drying wool. F. Moore, London.	3rd Jan.	91
Dyeing yarns. J. B. McKay, Glasgow.	9th Jan.	336
Dyeing textile, &c., materials. H. H. Lake, London.	10th Jan.	402
Dyeing textile fabrics, &c. W. M. Riddell, London.	11th Jan.	480
Driving the revolving rubbers on the double retaining rollers of screw gill machines for flax, &c. J. Brown, Belfast.	13th Jan.	535
Dyeing and painting cotton cords and fustians, &c., in two colours, producing a shot effect. J. Marshall, Todmorden.	20th Jan.	897
Drop-box motions for looms. T. L. Daltry, Manchester.	21st Jan.	930
Dobby apparatus (improving) by means of a new arrangement of levers, notched rods and catches. J. Irving, Barnsley.	24th Jan.	1,043
Edging and otherwise ornamenting with cord articles of textile fabric, and apparatus therefor. E. J. Shannon and S. Bennison, London.	10th Jan.	411
Examining the underside of cloth when being woven. J. Irving, Barnsley.	24th Jan.	1,040
Fly spinning and twisting. A. H. Briggs, Bradford.	20th Jan.	892
Foundations or rolling boards for piece goods. C. H. Priestley, Bradford.	23rd Jan.	989
Felting or fulling. H. H. Lake, London.	1990, 991 and 992	
Flats and fasteners for securing the cardclothing thereon. E. Tweedale, Halifax.	25th Jan.	1,121
Gig-mills for finishing woven fabrics. E. Michaelis and A. Smethurst, Manchester.	25th Jan.	1,120
Gloves, &c., in traverse warp machines. J. Upsdale, London.	5th Jan.	215
Ironing, glossing, smoothing linen, &c. H. C. Longsdon, Keighley.	30th Dec.	17,916
Knitting machines. E. W. Lee, London.	30th Dec.	17,959
Knitting machines. L. A. Groth, London.	19th Jan.	846
Looms. W. Bowker and R. Williams, London.	10th Jan.	415
Loom reeds. J. Yeadon, Bradford.	18th Jan.	774
Mules for spinning. J. T. Ainsworth, London.	31st Dec.	18,008
Machinery for making heads for looms. J. and C. A. and F. and H. Kitson, Bradford.	6th Jan.	231
Method of making traversed Lever's lace. J. C. Conduit, London.	10th Jan.	389

Mules for spinning. H. Ashworth, London.	11th Jan.	430
Manufacture of looped fabrics. C. and H. Cotton, Nottingham.	11th Jan.	439
Method of, and means for, producing patterns or designs on metal rollers or plates used in printing, embossing and shading textile fabrics, &c., and also for producing patterns, designs, or effects on other substances. C. J. and F. Edmondson, Manchester.	12th Jan.	498
Mules for spinning. H. H. Sinkinson, Manchester.	20th Jan.	882
Mechanical stokers. A. Thomson, Glasgow.	23rd Jan.	998
Manufacturing wood wool, &c. H. T. Anthon, London.	23rd Jan.	1,020
Operating the pile-cutting knife in looms for weaving seal-skin and other pile fabrics. H. Lister Halifax.	12th Jan.	497
Picking motion for looms. E. Brook, Halifax.	30th Dec.	17,910
Picking motion for overpick power looms. R. Hunter and T. McCreadie, Glasgow.	4th Jan.	150
Pulleys and drums. A. B. Perkins, London.	17th Jan.	746
Punching jacquard cards (means of, and machinery therefor), and mode of, and apparatus for, preparing draught plates therefor. P. Ambjörn Comte de Sparre, London.	20th Jan.	908
Preparing slivers of cotton, &c., for being spun into yarns or threads, and machinery therefor. R. Tatham, Manchester.	23rd Jan.	1,022
Preventing the ends or threads in spinning frames from becoming entangled with, or breaking, adjacent ends or threads. J. Barbour and J. Berkeley, Belfast.	25th Jan.	1,112
Reeling machines. J. Corrigan, Manchester.	31st Dec.	17,978
Rings and travellers for ring spinning and ring doubling, and for spinning and doubling cotton, &c. R. and P. and J. S. Eadie, Manchester.	31st Dec.	17,995
Regulating the supply of water to the rollers of wet spinning frames for flax, &c. J. V. Eves, Belfast.	9th Jan.	335
Stop-motions for spinning and doubling frames. G. H. Holden, Manchester.	2nd Jan.	6
Smoke consumer and super-heater for promoting combustion and economising fuel in stationary, &c., boilers. S. Brooks, Huddersfield.	4th Jan.	118
Scouring or dyeing woollen rugs or skins, with or without the wool or fur on them, or any woollen fabric, &c., and apparatus therefor. J. and J. C. Morland, London.	7th Jan.	329
Stop-motions for doubling, twisting, winding, drawing, preparing, and spinning machinery. A. H. Dixon and W. J. Gradwell, Manchester.	10th Jan.	376
Supplying oil, &c., for lubricating and moistening rags before passing them to the tearing machine. J. W. Vine, W. Fox, and B. Smith, London.	10th Jan.	391
Swells for looms. W. and S. W. Pemberton, and J. Slading, London.	12th Jan.	484
Shuttle checking appliances of looms. J. Marshall, Halifax.	16th Jan.	654
Self-acting mules for spinning. J. and L. May, London.	18th Jan.	792
Spinning and doubling. G. Bernhardt, London.	19th Jan.	863
Securing cards to flats employed in carding engines for carding cotton, &c. R. Tatham, Manchester.	21st Jan.	952
Squeezing fibres, &c. W. H. Beal, Halifax.	24th Jan.	1,053
Stop-motion for spinning, twisting, doubling, and winding machines. H. H. Lake, London.	24th Jan.	1,080
Twist-lace fabrics. J. and J. Smith, London.	18th Jan.	801
Thread spooling machines. W. and D. McGee, Glasgow.	21st Jan.	960
Travellers for ring spinning. E. Leak and T. B. Wilson, Manchester.	25th Jan.	1,110
Up-taking motion of looms. J. Mathieson, Glasgow.	16th Jan.	645
Warp looms. John Smith, London.	11th Jan.	458
Weaver's shuttle tongues. E. Haworth, Nelson-in-Marsden.	11th Jan.	468
Welt fork motion of under pick looms. A. Clegg, Manchester.	13th Jan.	536
Winding yarns or threads. W. T. and J. H. Stubbs, Manchester.	17th Jan.	755
Warp machines for producing fabrics of new or improved design. B. J. B. Mills, London.	24th Jan.	1,074
Winding frames. T. Guest and T. Brookes, Manchester.	26th Jan.	1,179
Warp lace fabrics. J. S. Wells, London.	26th Jan.	1,205
Winding bobbins. J. Stevenson, London.	26th Jan.	1,212

Patents Sealed.

14,121	15,413	16,061	16,291	16,443	17,053	560	885
1,401	1,882	7,815	9,349	11,883	12,681	12,902	14,295
16,218	16,894	17,148	32	2,771	8,205	13,073	13,976
14,388	17,083	17,097	17,111	166	1,217	1,375	12,977
13,993	14,414	162	172	232	16,481	140	144
174	175	308	13,615	16,259	16,583	12,770	13,736
13,761	16,250	518	532	640	1,055	13,817	14,898
15,890	531	818	828	5,097	14,043	14,104	14,156

The Journal of Fabrics AND Textile Industries.

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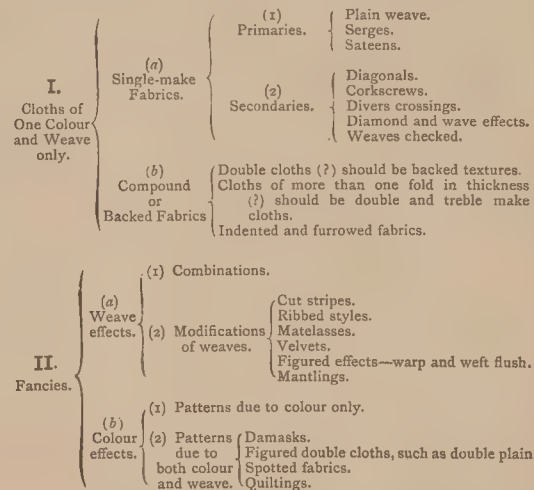
A Foreign Textile Work.

BY MR. ROBERTS BEAUMONT, M.S.A.

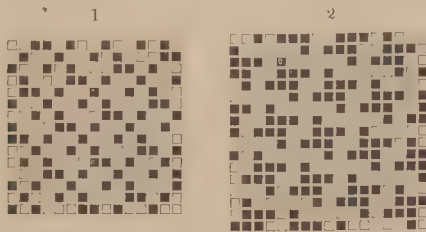
(Continued from page 14.)

M. Lelarge devotes the whole of his treatise, with the exception of a brief chapter on colour as applied to textiles, to the theory and composition of crossings, of a simple and complex character, for single, backed, and double, cloths. The structure of what may be termed the principal types of weaves is carefully and thoroughly analysed, and the various sorts of crossings are classified in such a manner as to facilitate the acquirement of a complete knowledge of their construction and origin. In the first chapter, the general principles of weaving are described, some explanations being, as we think, prematurely given on the Jacquard loom, so vague are the instructions on this loom, however, that they will serve rather to obscure, than to assist, the student at the arrival of the principles on which this admirable machine is constructed. This, it should be observed, is the only allusion made to machinery in the whole volume, and, neither in point of illustration nor in description does it favourably compare with other sections of the book. M. Lelarge classifies woven fabrics of all types under three heads, as follow:—(1.) Cloths produced by interlacing threads at right angles with each other. (2.) Transparent, or open, textures

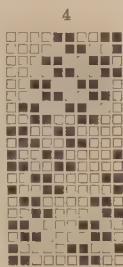
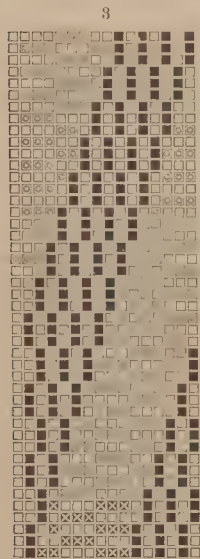
composed of both rectilinear and curvilinear threads, such as gauzes and lenos. (3.) Knitted fabrics. Strictly speaking, we are of opinion that knitted materials ought not to be included within the category of woven fabrics, the former being composed of one body of threads simply, while the latter, in all cases, are a combination of two distinct sets of yarns, known as warp and weft, so that the third class of cloths here given cannot be regarded as a product of the loom as generally and properly understood by this term. We are aware that the fabric obtained on the stockinette frame possesses some of the essentials of a woven textile, but, as it results from the interlacing of one series of threads alone, we prefer to retain what we believe to be the only correct definition of a textile fabric, namely, a texture constituted of both warp and weft yarns, and hence to exclude knitted goods from the category of loom productions. Plushes, velvets, and all types of pile goods are included in M. Lelarge's classification under the first series of fabrics. Here again we have to diverge from his theory of textiles, as we consider that plushes are sufficiently distinct from ordinary cloths in principle of interlacing, in appearance, and in structure, as to merit them being formed into a separate class. The volume is devoted exclusively to design as applied to cloths of the primary class. These are divided, in the first place, into two main classes, simple or plain fabrics and fancies. The former comprise cloths made of one simple crossing and of one shade throughout, while the latter include textures ornamented with both a combination of colours and weaves. Referring to cloths of one shade and weave, these are reduced to two series, namely—to simple and compound fabrics, that is to single and backed textures. "Singles" are classified as primaries and secondaries. Thus, while the primary group includes the plain cloth, serges, simple twills, and sateens, the secondary group includes diagonal patterns, and weaves of a complicated arrangement. Secondaries or compound textiles are divisible into three types:—(1.) Double cloths. (2.) Cloths of more than one fold in thickness. (3.) Ridged or furrowed cloths in which a wadding thread or pick is used. Regarding this classification of compound textiles, we would substitute backed for double cloths, and double and treble fabrics for cloths of more than one fold or thickness. This would be a more rational division, as backed fabrics, whether possessing an additional layer of warp or weft threads, are not, strictly speaking, double textures, and cannot be correctly defined as such. Fancies are divided into two categories, thus:—I., Fancies resulting from a diversity of weaves or crossings and comprising (a) designs composed of several weaves, and (b) designs due to a modification or reconstruction of weave; II., Fancies obtained by colour, including two species of patterns, (a) those developed by colour only, and (b) those formed of both colour and weave. From this classification of textiles M. Lelarge deduces the following diagram:—



Having thus obtained a rational and comprehensive table of the various descriptions of fabrics included in the first of the three great classes into which all textiles are divided at the commencement of the treatise, the authors proceed to describe each type of crossing separately. It is not possible for us to enter into the detail of the descriptions furnished, even if that course were likely to prove profitable, we shall have to confine ourselves to the leading features of the volume. Fabrics resulting from the employment of one weave, and formed of one shade of yarns only, are dealt with first. Of course, the plain weave, being the simplest of all crossings, receives detailed notice, its derivatives, amongst which are enumerated the different kinds of warp cords, weft cords, hopsacks, &c., are also lengthily treated of. Simple twills of the prunelle, crow, and cassimere type then receive special attention, instructions being furnished as to how they may be modified to produce broad twilled patterns. As in some other French works, some lengthy and, perhaps, unnecessary explanations are given on weaves of a sateen order. Many of the matters treated of are so extremely simple as to be evident on a first examination, yet they are dealt with at an extraordinary length. The examples supplied of weaves with a sateen basis are not of the most effective character. We extract two of them, weaves 1 and 2:



The former of these crossings does not possess any features of great merit, and certainly would be indefinite in effect in the woven fabric, but the latter is a valuable weave. In diagonals, some fairly illustrative examples are given, but the crossings are not sufficiently diversified in character. We quote two illustrations, namely, the weaves represented in Figs. 3 and 4.

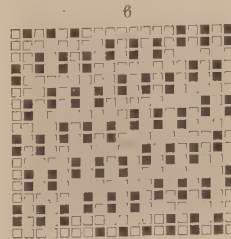


Both are makes of a well known type, and hence need no description. Corkscrews, or round twills, are, on the other hand, extensively and ably illustrated and described. In addition to ordinary makes of this class, several modifications of a useful and interesting character of this valuable principle of intertexture are given.



Two examples may be alluded to, the former, Fig. 5, is a corkscrew possessing a decided diagonal effect, the

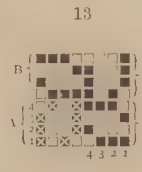
latter, Fig. 6, is a pattern



of which each furrow is composed of three sets of distinct twills. Both weaves are good, and may be regarded as the representatives of a fairly extensive series of patterns procurable on these principles by ingenious manipulation. Allusion is also made to stripe, check, and other effects, obtained on the corkscrew basis of intercrossing. Examples follow in weaves constructed on various principles, including several well known makes. Two weaves, Figs. 7 and 8, will serve to illustrate the value of the illustrations in crossings of this order. Patterns of a wave description are described under three classes, (i) those in which the weaves cut each other; (ii) in which they form a pointed effect and meet like the lines forming the apex of a triangle; and (iii) in which, the weaves being of an upright twill type, the design produces a zig-zag arrangement. In Figs. 9, 10, and 11, the effects of these different kinds of wave crossings in the woven product are represented. Passing over the illustrations in diamond patterns, we might briefly allude to



the designs resulting from setting small weaves one the reverse of the other in the construction of new crossings. Three examples—Figs. 12, 13, and 14—will be sufficient to illustrate this class of



crossing. Backed and double cloths, as well as textures, in which a wadding thread is employed to impart thickness to the piece, are described in detail, and generally in concise and plain terms. So familiar, however, is every student, conversant with the structure of these fabrics, with the illustrations which occur in this part of the treatise that we need not at this time do more than name them in passing, they include weaves backed with warp only, with weft only, with warp and weft—arranged one thread face to one thread back, two threads face to one thread back, &c.

(To be continued).

A correspondent in Lille says that the French flax industry is rapidly becoming a thing of the past. Many of the manufacturers have either closed their works, or have greatly reduced their production. The decline of this once important industry is due to the increasing use of cotton goods, which, though not as durable, present advantages in other respects. At one time, the flax mills in France contained no fewer than 700,000 spindles, but when cotton again came into the market after the American civil war, the immense stocks of linen goods in France had to be cleared out at any price. It is said that the flax spinners in the North of France have now lost all hope, and that the cultivation of the plant will probably be abandoned.

Carding Engines and their Clothing.

A Lecture given at East Crompton,

BY MR. JNO. BUTTERWORTH, F.R.M.S.

Of all the machines required in cotton spinning, I think the carding engine stands at the head in point of importance. The errors of all other machines in the cardroom can be corrected by taking the work back to the mixing, but bad work from a carding engine might as well be sold as waste, it spoils everything it touches. No machine has deviated less from the original lines upon which it was constructed, and while we are compelled to admit that improvements have been made in it allowing a greater production, those improvements cannot be said to go beyond the more accurate fitting of the principal working parts which it now receives at the hands of the maker, together with more careful clothing. Machine makers long ignored the fact that cylinders and doffers were rarely ever true when they left the lathe, till the plan of passing card fillets under an emery disc by the card maker, to render all the teeth of one uniform length, proved them to be so. Now, no cylinder or doffer is considered to be true enough till it has been ground up by an emery disc. The more accurate system of blocking unavoidable spaces, together with the gain in card wire by the more accurate making of tail ends, has lessened waste and added to the production. I am not here to-night to sing the praises of any make of card or card clothing. I only wish to raise a few queries that have passed one's mind while watching the progress of many reported improvements. It is well known that Oldham has stuck very tenaciously to the roller and clearer card, and for the great bulk of the weft trade it is undoubtedly the right card to use, and, while many are changing roller and clearer cards for revolving flats, there are old firms who could not be induced to change on any account. The reason why people rush to change from the roller and clearer card to revolving flats is not far to seek, the reputed production of

THE REVOLVING FLAT CARD

is the great inducement. Seven hundred pounds per week is not thought by some to be too great a production for a single roller and clearer card, and 1,000 lbs. per week for a double one, but we are now asked by some makers of revolving flat cards to expect 1,000 to 1,100 lbs. per week from the latter card, and are told that this card will produce cleaner, stronger, and more yarn in proportion to the roller and clearer card, (the conditions being equal) which results from the difference of carding surface between the two. The fact that the yarn is stronger, which can only result from the fibres being laid straighter, and, of course, bound more compactly together, ought to convince any one that the yarn from each card must be differently constructed, hence, is it wise in all cases to change from one to the other? Under favourable conditions, single revolving flat cards have long been capable of a production of 700 lbs. per week. I was taken to task for making this statement at the bi-annual meeting of the Manufacturers' Association, Boston, U.S., in 1884, and I was credited with having become Americanised very soon after arriving there. I was able, however, to prove my point, so I had no fear, the result was that we had some half-dozen American manufacturers over here the following summer, three of them visited me while they were over, and I understand that considerable business has been done with them in cards since the above date. I have mentioned this circumstance, because I wish to point out that the above production was from cards that were made on the old plan with a flexible bend set at three points. I see no reason why a single revolving flat card, 50 by 45, should not produce from 700 to 800 lbs. per week of good carding, out of suitable cotton, but to expect them to do so out of any class of cotton, is to expect more than they will do. I know cases where cards have been started at 900 to 1000 lbs., but after a few months' working, they had to be cut down to a little over 600 lbs. per week. The increased production of the revolving flat cards has been largely got out of the increased number of carding points gained by making the flats narrower, and getting a greater number to work at one time, but the carding power thus gained

is largely counteracted, as well as the cleaning power being much lessened, by the increased speed of the doffer. When I was learning to card I was given to understand that carding took place in any part of a carding engine where the points of the wire stood facing each other, no matter whether those points receiving the fibre stood still, moved with, or moved against, those that delivered the fibres to them. Carding, however, is increased or diminished in proportion to the speed at which the points receiving the fibre travel from those that deliver it, and when the surface speed of a doffer reaches upwards of 100 feet per minute its carding power is not very great. I am favourable to any improvement in machinery that will lessen the cost of production without damaging the finished article, but I confess I am suspicious of the enormous production claimed for revolving flat cards. I do not think it is proved yet, and it will take a length of time to prove it, so we must watch and wait. If you ask what are the grounds of my doubts, I answer, it is the quality I question. I am certain that cheapening production covers a lot of sins. I cannot reconcile clearness and straightness of fibre in a carded sliver that is hurried through at the speed it has to be against that of a moderate production, and production that is gained in any department at the sacrifice of the quality of the finished article may suit the exigencies of the moment, but it is unsound policy. Three objects are aimed at in the present make of revolving flat cards, first, increase of production; second, the uniform accuracy of a certain working distance of all the card wire; and third, the easy adjustment of all the working parts. The accomplishment of the first depends on the successful carrying out of the second. The third is open to question when dependence is placed on setting by dials owing to the wear and tear of the several working parts not being uniformly equal. It does not come within the scope of this paper to describe the manner in which these objects are carried out. I have not thought it necessary to go into any description of the roller and clearer card. It is well understood in Lancashire, its place in the economy of spinning is more in the production of wefts, and those who understand it will not fail to recognise its merits. I must now pass on to

THE QUESTION OF CARD CLOTHING,

in which there has been many changes during the last twenty-five years. I only wish I could say that every change has been an improvement. The foundation of all card clothing originally was leather, and it served its day very well, but I fear, if it was the only material used to-day, there would be loud complaints, as many of you are well aware that leather is a very variable material. The foundation of cotton cards as at present made consists of three kinds—the first is made of several layers of cotton cloth, or calico, cemented together by a flexible cement; the second is made up of layers of a cotton cloth, with a layer of india-rubber, all of which are cemented together with the above cement; the third is made up of woollen, cotton, and sometimes linen, cloth cemented together as before. All these cloths have their respective merits, but none of them can be exclusively recommended for every class of work. What is required in a foundation for cards is a uniform solidity during the life of the card, allowing during the same period a uniform flexibility to each tooth in all cards that have to cover cylinders, doffers, rollers, and clearers, as well as flats. Takerins and feed rollers are now being largely covered with Garnet's saw tooth, which is inserted in a spiral groove cut in the roller or takerin, and is known as the metallic covering, or the inserted saw tooth. Before this mode of covering takerins and feed rollers was introduced, they were mostly covered with Ashworth's saw tooth, which was inserted in leather or strong cloth as a foundation. This was an improvement over the old plan of covering takerins, with ordinary round-wire fillets that had to be ground with the rest of the card, but it was liable to the same fault that all covering has had (except metallic covering) for takerins and feed rollers, viz.:—the teeth becoming slack in the foundations, which caused them to stand back out of the vertical line in which they had been originally set, hence, instead of taking firm hold of every lock of fibre, they let much of it go, leaving a greater bulk for the following teeth to carry forward, causing a great amount of chafing of the fibre. This was not the only evil, but it was enough to cause any real improvement to be welcomed, and I do not think many will

question that the metallic takerin and feed roller as now made is an important improvement upon all that has preceded it. I hardly need remind you that an entirely different foundation is required in this part of a carding engine to that of the other parts. The teeth cannot be too rigidly fixed to disentangle the fibre as it is presented to them. Then, again, the Garnet tooth never requires grinding nor dressing as other parts of the card do. All card wire that has to be ground should yield to any necessary pressure required in grinding a good smooth point, but the moment it has passed under the emery, the elasticity of the foundation and the wire should be such as to bring back the point of the tooth to its normal position. I may further point out that this flexibility is a great factor in enabling a card to rid itself of the dust and short fibre, during grinding operations, which have become felted between the teeth while carding. We have been told, however, from several quarters, that by adopting any of the several forms of needle pointed wire, of which so much has been said of late, both grinding and stripping would be almost unnecessary. I am prepared to believe that if ever a true needle point can be made in fine, as well as it is done in coarse, wire, less stripping will then be required, and grinding will be unnecessary. All changes that have been made in the form of the card tooth during the last twenty years have been carried out with a view of accomplishing the same results that would be gained if a true needle point could be made, and it would seem a pity that the very modes adopted to produce several imitations of the needle point render abortive the accomplishment of the object intended, which I shall no doubt be able to show.

(To be continued.)

The Manufacture of Multi-Coloured Plush and other Pile Fabrics.

An improved method of manufacturing the above descriptions of fabrics has been patented in this country by Mr. W. Weegmann, of Elberfeld, Germany. Plush fabrics, such as those to which this invention has reference, are composed of two or more different kinds of threads, principally wool, silk and cotton, either of two of them combined, or of all three. The figuring is generally formed of the one kind of thread, and the ground of the other. According to the present invention, the plush fabric is made of undyed yarns, and is then dyed in the piece in specially prepared dye baths, in such a manner that the different kinds of yarns each receive a different colour, or a different tint. Such plush fabrics have, up to the present time, been made of dyed yarns, and not dyed previously in the piece. Undyed plush fabrics, of different kinds of yarns, have therefore either not been made at all hitherto, or they have not been made to be dyed in the piece. The process of dyeing is based on a choice of colouring matters, of which one set will only dye one kind of yarns, while the other set will only dye the other kind. With these dyes, one or more baths are prepared, according to the nature of the yarns employed in the fabric which is to be dyed in the piece. The inventor has prepared several descriptions of multi-coloured plush fabrics according to the above described principle, the following being the process used for certain combinations of yarns, while taking into consideration the behaviour of the several kinds of yarn with reference to the dyes employed. In the dyeing of a plush fabric composed of woollen and silk plush in two colours, when these fabrics are made, say, with a figuring of woollen plush upon a ground of silk plush, or with a figuring of silk plush upon a ground of woollen plush, or with a figuring of both kinds mixed, the patentee found that, in addition to those dyes which colour silk and woollen fabrics both in the same way, and which it has been hitherto believed could alone be used for both kinds of yarns, because both are of an animal origin, there exists a series of dyes which will only colour wool, and not, or only to a small extent, silk, and that there also exists a second series of dyes that are taken up by silk, and not, or only to a small extent, by wool. To those colouring matters that only dye wool and not, or only to a small extent, silk, belong the indigo preparations, and certain aniline colours, in particular those of the azo-group. Silk, on the other hand, is mainly only dyed by those aniline colours which exist in trade more particularly as cotton dyes, while wool remains almost entirely untouched by these colouring matters. These last named dyes have, as far as is known, not previously been used for dyeing silk. According to the present invention, dyes of each of the above kinds are either made into two separate baths in which the fabric is successively treated, or the two kinds of dyes may be mixed in a single bath, in which the fabric is dyed in the above described manner by a single operation. The preparation of the dye baths does not differ materially in either case. The dye or dyes are dissolved in acidulated water, and the fabric is dyed at boiling temperature. As it is more convenient to place the dyes together in a single bath, the inventor, by preference, effects the dyeing of woollen and silk plush fabrics in a single bath, but they can be dyed in two baths, of which one contains the dye for the wool and the other the dye for the silk. It is not possible to name all the different dyes which act in the above manner upon wool and silk, and which are, therefore, suited for the new process for dyeing fabrics of wool and silk plush. In order, however, to determine these dyes, it is only necessary to examine the action of the

different dyestuffs of commerce in a bath. The use of the dyes always takes place in the above described manner. The inventor describes as follows the improved process in connection with some specific colours. A bath in which the wool plush of the fabric is dyed blue, while the silk plush is dyed yellow is prepared of the following dyes:—Indigo carmine, saffronine, aniline yellow (prepared for cotton dyeing), and Indigo solution (prepared for cotton dyeing). These dyes are all brought together in water containing two per cent. of sulphuric acid, and in the bath so obtained the plush fabric is dyed in the usual manner at boiling temperature. The indigo and the saffronine (belonging to the azo group) dye the woollen plush, and the aniline yellow and indigo solution, prepared for cotton dyeing, dye the silk plush. Two separate baths might be used, the one having indigo and saffronine for dyeing the woollen plush, the other having aniline yellow and indigo solution, both prepared for cotton dyeing, in which silk plush would be dyed. Such a division of the dyes into two baths does not require any difference in the dyeing process and can be effected in all cases. For a dye bath, in which the woollen plush is dyed bordeaux red, and the silk plush yellow, may be taken:—Acid fuchsine, azo yellow, aniline yellow, (prepared for cotton dyeing), and indigo solution (prepared for cotton dyeing). The two first named dye stuffs dye the wool, the others the silk. The dye stuffs are dissolved in acidulated water, and the fabric is dyed at boiling heat, as before. In another dye bath consisting of:—Acid fuchsine, the azo yellow known as "Echt Gelb," indigo carmine, and indigo solution (prepared for cotton dyeing), the woollen plush will be dyed brown, and the silk plush bluish gray. The three first named dyestuffs act on the wool, while the silk is only acted upon by the last one. In another bath containing picric acid, light green, and indigo carmine, the woollen plush is dyed dark blue, and the silk plush peacock blue. The picric acid and the light green dye both wool and silk equally, but the indigo carmine dyes the wool alone, so that the latter is coloured by all three dyes, and therefore obtains a different colour from that of the silk. The dyer has it in his power, by the choice of the quantities of each dye stuff, as also by subsequently adding dyes during the dyeing process, which act upon the one or the other part of the fabric, or by proportioning the duration of the process, to produce various tints or shades, or to alter these during the process. After dyeing, the fabric is washed as usual in order to remove the superfluous colour. In the fabric above described, both wool and silk yarns are woven so as to produce a plush surface, but the one or the other kind of yarn can be woven entirely or partially smooth, so that a figuring of, say, wool is produced upon a smooth silk ground, or vice versa. Plush fabrics that contain cotton, with wool or silk, or in addition to wool and silk, are dyed in two baths, having regard to the necessity of mordanting the cotton for taking up the dyes. The cotton is mordanted after dyeing in the first bath, and, if it has taken up some colour, it is bleached in a weak chloride bath, after which it is dyed in the second bath containing the before mentioned dye stuffs that are prepared for cotton dyeing and, lastly, the fabric is washed. The first bath is acidulated with two per cent. sulphuric acid and is used at boiling heat. In the second bath, the dyeing is effected at about 40° cent. or 104° Fahr. The process as carried out with fabrics having cotton combined with wool or silk, or with both, is as follows:—(1) Plush fabrics of wool and cotton plush:—the first dye bath contains the dye stuffs for the wool. For this the dye stuffs which die wool generally may be used, as they do not dye the unmordanted cotton. The second dye bath contains those of the above mentioned dye stuffs prepared for cotton dyeing that only dye cotton and not wool. As an example of this process the following may be given:—The first dye bath for wool plush contains indigo extract and aniline yellow dissolved in water with two per cent. sulphuric acid. The fabric is dyed in this bath at boiling heat. Any slight colouration of the cotton in this bath is removed by a weak chlorine bath, and the fabric is then washed, and is mordanted in tannin and antimony fluoride dissolved in water. The fabric is then put into the second bath containing saffronine and phosphine. In this bath the cotton plush is dyed at a temperature of about 40° cent. or 104° Fahr., and lastly it is washed in water. (2) Plush fabrics of silk and cotton. The silk is dyed in the first bath, acidulated as above described; as dye stuffs for this, those are used which are generally suited for dyeing silk, that is to say, either those which dye wool and silk equally, or dye stuff prepared for cotton dyeing. In the second bath for the cotton only the last named dyes are used. But as these also dye the silk again in the second bath, the silk obtains a mixed tint. The process of dyeing is the same as already described, the cotton, being, if necessary, bleached after the first dyeing, after which it is mordanted, washed, and dyed in the second bath, and lastly washed again. The plush fabric of silk and cotton may also have a flat visible ground of either silk or cotton. The process remains the same as above. (3) Plush fabrics of wool, silk and cotton plush. Two baths are again used; the first bath is prepared in the same manner and with the same colours as above described for wool and silk fabrics. In this bath the wool and the silk each receive their particular colour. The fabric is next washed, and, if necessary, bleached, then mordanted as described, and afterwards the cotton is dyed in the second bath. The second bath contains the dye stuffs prepared for cotton dyeing as above described. As these again dye the already dyed silk, the latter receives a mixed tint. The following serves as an example of the process of dyeing for plush fabrics of wool, silk and cotton. The first bath for dyeing the wool and silk in two colours consists of:—Acid fuchsine and aniline yellow for dyeing the wool, aniline yellow (prepared for cotton dyeing) for dyeing silk. These dye stuffs are dissolved in water containing two per cent. of sulphuric acid as above described, and the fabric is dyed at boiling temperature, if necessary bleached, then mordanted in a bath of tannin and antimony salt, after which the cotton is dyed in a second bath containing aniline blue (prepared for cotton dyeing) at a temperature of about 40° cent. or 104° Fahr., and the fabric is then washed. The result will be a brown colouring of the wool plush, a greyish green for the silk plush, and a light blue for the cotton plush. With this kind of fabric, a part of the yarns may appear as visible flat ground, the same dyeing process being used. In all the above described cases, the fabric may either have a cut, or an uncut, or looped pile.

Native Industry in Roumania.

It may interest some of our readers to know that in order to encourage native industry in Roumania the Government have issued a new law which was published in the *Moniteur des Intérêts Matériels* for January last, and from which the following is an extract:—Any person deciding to establish a business in this country, with a capital of 50,000 francs, and requiring to employ 25 workmen daily, will participate in the advantages of the new law, on condition that (1) within a period of five years from the establishment of the factory, two thirds of the workmen are Roumanians, (2) that the person wishing to establish any industry satisfies the Ministry of agriculture, industry, and commerce, that he has the necessary capital and the number of workmen, and proves by plans and a detailed statement of the business he proposes to carry on, that he will actually establish a factory and employ 25 workmen daily, and that he will employ machines, and technical processes, and improved machinery, which must be confided to the care of specialists. (3) If proprietors of these establishments fulfil the required conditions, they can obtain gratis the possession for 90 years of from one to five hectares of land on any property of the State, Communal, or Crown lands, but lands situated on Communal properties can only be given conformably to the provisions of the Communal law. No rent will be demanded for the establishment of means of communication (roadways, railways, tramways) intended to place the factory in communication with a main-line railway station, river or canal. If the industrial establishment for which the land was given be not commenced within two years, the land will return to its former owner. Any industry established under the fore-named conditions will enjoy the following advantages:—(a) Freedom from taxation for a period of 15 years. (b) Admission free of duty of all machinery, as well of all parts of machinery and all accessories, imported from abroad for use in the factory. (c) Admission free of duty of raw materials used in manufacture, if those materials cannot be obtained in sufficient quantity in the country. (d) Carriage by railway of the produce of these industrial establishments, from the factory to the destination, will be effected at the lowest rate, which should not, in any case, exceed the net cost of carriage increased by 20 per cent. (e) Consignments of articles, in that they concern raw materials, machinery, and all articles used in their production, will be treated in the same manner. (f) All articles imported, which are re-exported after being worked up in the country, shall be at the time of their re-exportation entitled to a drawback equal to the duties paid on their importation. The authorities have decided that articles manufactured in the country will be preferred for the supplies of the Government and the various Communes. A subvention will be accorded by a special law to the industrial establishment, which will create a practical school to teach workmen the several branches of manufacture.

Softening Materials used in Printing.

Softening materials for the above purpose are of two kinds, viz.:—those that by their presence give a soft feel and hygroscopic materials which, because of their power of taking on moisture, give a soft feel. The most important substances in use are glycerine, glucose, cocoa-nut, olive and turkey-red oils, fats, paraffin, spermaceti, stearine, tallow, bees-wax, ozokerite, salts of soda, calcium, ammonia, and zinc. Glycerine, which possesses the power of combining with nearly everything in use for printing, is the softening material generally employed, it is easily applied, makes the fabric softer, more supple, more oily, and gives it an even moisture. But before using it, printers should test it carefully, as it is not uncommon for products sold under that name to be composed of glucose, chloride of magnesium, &c., &c. The following substances are insoluble in it:—iodides of lead and mercury, calomel, bisulphide of carbon, chloroform, ether, fatty and essential oils, fatty acids and resins, but they are not much used in printing. Glucose or starch gives suppleness without greatly increasing the weight, but, as it causes difficulties on account of the moisture it absorbs as well as because of the injury to which it renders the material liable, it is necessary to use it with much care. Wherever the colours employed are loose, glucose hastens their destruction. Fatty matters, such as tallow, stearine, and soaps, increase the weight, and lessen the

stiffness of the fabric, rendering them more supple, and they finish better than when some other softening materials are employed. Bodies containing alkaline earths should not be used with these substances, because insoluble soaps are formed which injure the prints operated upon, but heavy bodies, such as China-clay and plaster-of-Paris can be more easily employed. Alkaline salts (salts of soda and ammonia) neutralise acids in the dextrine, and remove any excess of fats, and thus soften the goods. Chlorides of zinc and calcium are merely used as water absorbents. Very little must be employed. If too much chloride of zinc is used, it acts upon the tissue and weakens it, and sometimes, also, it makes it too soft. Common salt is used for a similar purpose. A mixture composed of glycerine, dextrine and Japan wax, and called *dulcine*, is used in England, while Freppel's preparation, made from Iceland-moss, glycerine and a very little bisulphite of soda, is used in France.—*Le Teinturier Pratique*.

Modifications of Import Duties.

PERU.

We hear from a correspondent in Lima that the Peruvian Government has increased the import duty on all goods by 5 per cent., that is, for instance, that articles which were formerly subject to a duty of 40 per cent will now have to pay 42 per cent, the increase being calculated on the amount of the duty. The charge for bonding goods has also been raised from $\frac{1}{2}$ to 1 per cent per month.

VARNA.

A correspondent in Varna says that all goods imported into Southern Bulgaria are subject to a duty of 8 per cent. *ad valorem*. All goods exported from Southern Bulgaria to Turkey pay the same duty. Merchandise in transit for the two countries are exempt from duty, with the exception of wine passing through Turkey, which has to pay a transit duty of 1 per cent.

ITALY.

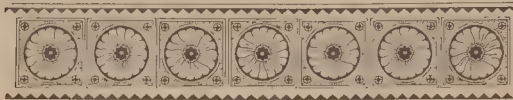
The following decisions affecting the classification of articles in the Italian Customs Tariff have, according to the Italian *Bollettino di Legislazione e Statistica Doganale e Commerciale*, been recently given by the Italian Customs authorities:—Srips of coloured tissue having the woof of cotton and the warp of hemp (hemp predominating)—duty, 130 lire per 100 kilos. Petticoats of felt having for ornament a strip of dyed cotton tissue with woollen embroidery—duty, 200 lire per 100 kilos., additional to the duty on the tissue of which composed. Trade catalogues, if in foreign languages, are admitted duty free, if in Italian, they will pay the duty on the paper of which composed.

RUSSIA.

The following proposed modification of import duty on cotton yarn is extracted from the *Journal de St. Petersburg*:—"The *Novoe Vremya* announces, under the heading of very important news for the Russian commercial world, that the rumour to the effect that the Minister of Finance would appoint a special commission charged with the examination of a proposal to abolish or reduce provisionally the import duties on foreign cotton yarn is well-founded. The Moscow council of manufacturers has been requested to nominate three delegate experts, and it has appointed MM. Yakovlevich, Krestovnikov, and Schoriguine, who are about to visit St. Petersburg in order to take part in the proceedings of the new commission. Manufacturers of printed cotton goods intend to present to the Ministry a petition asking for the importation free of duty of foreign bleached cottons."

UNITED STATES.

The following decisions affecting the classification of articles in the Customs Tariff, and the application of the Customs Law of the United States, were given by the United States Government during the months of December and January last:—Two ply ingrain carpets are held to be dutiable at the rate of 8 cents per square yard and 30 per cent. *ad valorem*, under the special provision therefor in section 375, whether imported in the form of squares or otherwise. It is held that completed and separate cotton damask table-covers or table-cloths are dutiable at the rate of 35 per cent. *ad valorem*, under the provision in Schedule I. (T. I., 324) for "all manufactures of cotton not specially enumerated or provided for," and that the further provision in said Schedule (T. I., 325) for "cotton damask" applies only to such fabrics when imported in the piece. Cotton handkerchiefs imported in separate pieces, but not hemmed, do not come within the provisions in Schedule I. (T. I., 325) for "handkerchiefs hemmed," but are held to be dutiable at the rate of 35 per cent. *ad valorem*, under the further provision in said Schedule (T. I., 324) for "all manufactures of cotton not specially enumerated or provided for." Cashmere and other dress goods, composed wholly of wool with the exception of a small percentage of cotton—say, from $\frac{1}{2}$ per cent to $\frac{5}{8}$ per cent, which are commercially known as all-wool fabrics, are held to be dutiable at the rate of 9 cents per square yard and 40 per cent. *ad valorem*, under the provision in Schedule K. (T. I., 365), which imposes that rate of duty on fabrics of this character when composed wholly of wool, or where cotton or other material is introduced for the purpose of changing their classification.—*Board of Trade Journal*.



ORIGINAL DESIGNS.

On our first plate, we give a design for a Silk Handkerchief, which has been drawn for us by Mr. F. Layton, York Terrace, Akroydon, Halifax.

Our second contains a pattern adaptable for either Worsted or Linen Damask.

On our third, we give a design for a Printed Blind, which should be produced in three colours, viz.:—cream ground, ornamented in pale sage green and a light shade of Indian red or blue.

MONTHLY TRADE REPORTS.

Wool.—At the London sales, although they opened with a spirited demand and increased prices, there was a dragging tendency towards the close, and rates receded from ½d. to 1d. per lb. below the highest prices paid during the sales. At the Edinburgh and Glasgow sales during February, only a moderate business was done, and although there was generally a good attendance of dealers, prices, on the whole, were nearly on a par with last sales. In the Yorkshire districts, a medium business has been transacted, but staplers who only hold light stocks have stood out for firm rates, as, although the new clip is near, they cannot replace existing stocks at paying rates. The consumption of wool is below the average, still, in the face of this, prices keep moderately firm. The yarn and piece branches have been generally quiet, and the orders that have been given out have mostly been in small quantities. The severity of the weather, both at home and abroad, has had a tendency to curtail business in spring goods.

Woollen.—Although there is a hopeful feeling of a good business being done in the woollen branches in the immediate future, still, during the past month, producers have been rather disappointed at the small number of orders that have been given out. The recent cold weather has had its effect, and thrown business back somewhat. In the finer classes of worsteds, there has been a falling off in demand, more favour having been shown to medium classes both in worsteds and woollens. Reports from retail houses prove that a much smaller business is being done, than is generally the case at this time of the year. Manufacturers are, as a rule, fully employed, but many are making to stock, preferring to do this to running short time. Prices have kept very firm, and there seems no prospect of a downward tendency.

Cotton.—Business in the different departments of the cotton trade has improved during the month. The sales of cotton have kept up to the average, and prices, although fluctuating more or less according to demand, were, at the close of the month, firm, with no disposition to a downward tendency. The yarn trade has kept fairly good, the orders recently booked having been satisfactory to producers, both as regards bulk and prices generally, manufacturers having secured work for some weeks to come. This state of things has had the effect of hardening rates for future orders, and spinners are indisposed to enter into new contracts except at a decided advance. In the cloth branches, a steadier demand has been experienced at rather harder rates, this applying more particularly to the export branches, the orders booked for India, China, and Japan being satisfactory. For the home trade also, many new contracts have been taken, and, generally, the demand is rather in excess of the supply.

Linen.—There is little new to report in this branch of textiles, the trade having been, on the whole, rather quiet. Damasks have had a dragging sale, only a moderate turnover having been effected, and this mostly for home account. Drills have sold fairly well, especially those of a fancy nature. The smaller kinds of fabrics, such as dusters, rubbers, tea-cloths, towels, &c., have sold moderately. Hand loom goods generally have been a shade brighter. The flax markets have shown no new features, and prices are unchanged. Jute has had an average amount of attention, at prices about as last month.

Lace.—The general demand for lace goods has been flat, there being no improvement to note since our last report. In novelties, there has been little new. A moderate inquiry for Brabant, Maltese, Torchon and Edelweiss laces has taken place, but the prices offered have not been remunerative, and, generally, the demand does not keep pace with the supply. The curtain trade has been fair, but there is much room for improvement in this branch. Prices, as a rule, are moderately firm.

The Glasgow Exhibition.

The executive of the Glasgow Exhibition have made, and are still making, every endeavour to eclipse the one held in Manchester during the past year. This will prove a very difficult matter to accomplish, still there is no doubt that an excellent display will be made. It is our intention to devote a considerable portion of our space, during the exhibition, to articles and reports of all the textiles and machinery which may be specially interesting to our readers. There are no fewer than 1,200 firms, 100 of whom are from abroad, have applied for space. An idea of the variety of exhibits may be gathered from a perusal of the names of the places from which they come. London, of course, heads the list of English houses, no fewer than 83 having procured stands, whilst 32 Manchester firms have done likewise, which proves that their experience at their own exhibition was beneficial. Liverpool, Rochdale, Preston, Bolton, St. Helens, Bury, Stockport, Widnes, Oldham, Ashton-under-Lyne, Church, Ashton, Earlstown, and other centres of industry in Lancashire furnish exhibitors. Yorkshire is largely represented by such places as Sheffield, Leeds, York, Halifax, Elland, Huddersfield, Hull, Pontefract, Keighley, Middlesbrough, Rotherham, Shipley, and Wakefield. Other counties are also represented, a large number of exhibitors being from Nottingham, Leicester, Lincoln, Newcastle, Sunderland, Durham, Stockton-on-Tees, South Shields, Gateshead, Bristol, Birkenhead, Macclesfield, Northwich, Warrington, Dukinfield, Carlisle, Keswick, Birmingham, Kidderminster, Redditch, Stourbridge, and other places too numerous to mention. Altogether, the executive have just cause for congratulating themselves upon what appears to promise more success than has been anticipated by those who consider the exhibition craze to have been much overdone of late years.

Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, February 25th, was 424. The number in the corresponding four weeks of last year was 404, showing an increase of 20, being an increase in 1888, to date, of 31. In addition to these gazetted failures there were 268 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks, making a total in 1888, to date, of 419. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, February 25th, was 1017. The number in the corresponding four weeks of last year was 1134, showing a decrease of 117, being a decrease in 1888, to date, of 185. The number published in Ireland for the same four weeks was 35. The number in the corresponding four weeks of last year was 73, showing a decrease of 38, being a net decrease in 1888, to date, of 35.

The silk and velvet industries in Rhineland may almost be said to have reached the verge of ruin, owing to the absence of any steady demand worth speaking of. Large amounts of capital and great skill are engaged in these industries, and a change in the market would suffice to restore the former prosperity. As things are at present much misery seems to prevail in these districts.



London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1878.



Philadelphia, 1876.



Dublin, 1865.



Leeds, 1875.



HEATS THE FEED WATER WITH THE WASTE HEAT TO A TEMPERATURE
CONSIDERABLY ABOVE BOILING.

CONTRIBUTES GREATLY TO THE DURABILITY OF BOILERS.

Can be applied without stoppage of works. Has been in operation to
every description of Boiler for upwards of 35 years.

IMPROVEMENTS have just been MADE in the CONSTRUCTION and DETAILS of the MACHINE.

The Pipes are cast VERTICALLY and in DRY SAND MOULDS.

THESE ECONOMISERS ARE NOW CONSTRUCTED FOR EXTREME HIGH PRESSURES.
PROVISION MADE AGAINST INCRUSTATION AND MUDDY WATER.

1887. New Patents. 1887.

No fewer than SIXTEEN PRIZE MEDALS have been gained by the
Economiser, the highest award being obtained in every case for sound workmanship
and superiority of design.

Original Inventors, Patentees, and Sole Makers,

EDWARD GREEN & SON,

ST. ANN'S SQUARE, MANCHESTER.

WORKS:—WAKEFIELD, YORKSHIRE.

PATTERNS FOR Worsted, Woollen & Mixed Cloths.

These Patterns are from a new source, and include French and English Coatings, Vestings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths and Dress Goods.

They give the latest Designs and Colouring for Cloths for the Seasons in 1888. Large numbers of the Samples are now being sold to Manufacturers throughout the Woollen and Worsted districts.

100 SAMPLES FOR £2.

CARRIAGE FREE.

FOR THE UNITED STATES TEN DOLLARS.

A Remittance must accompany Order, made payable to

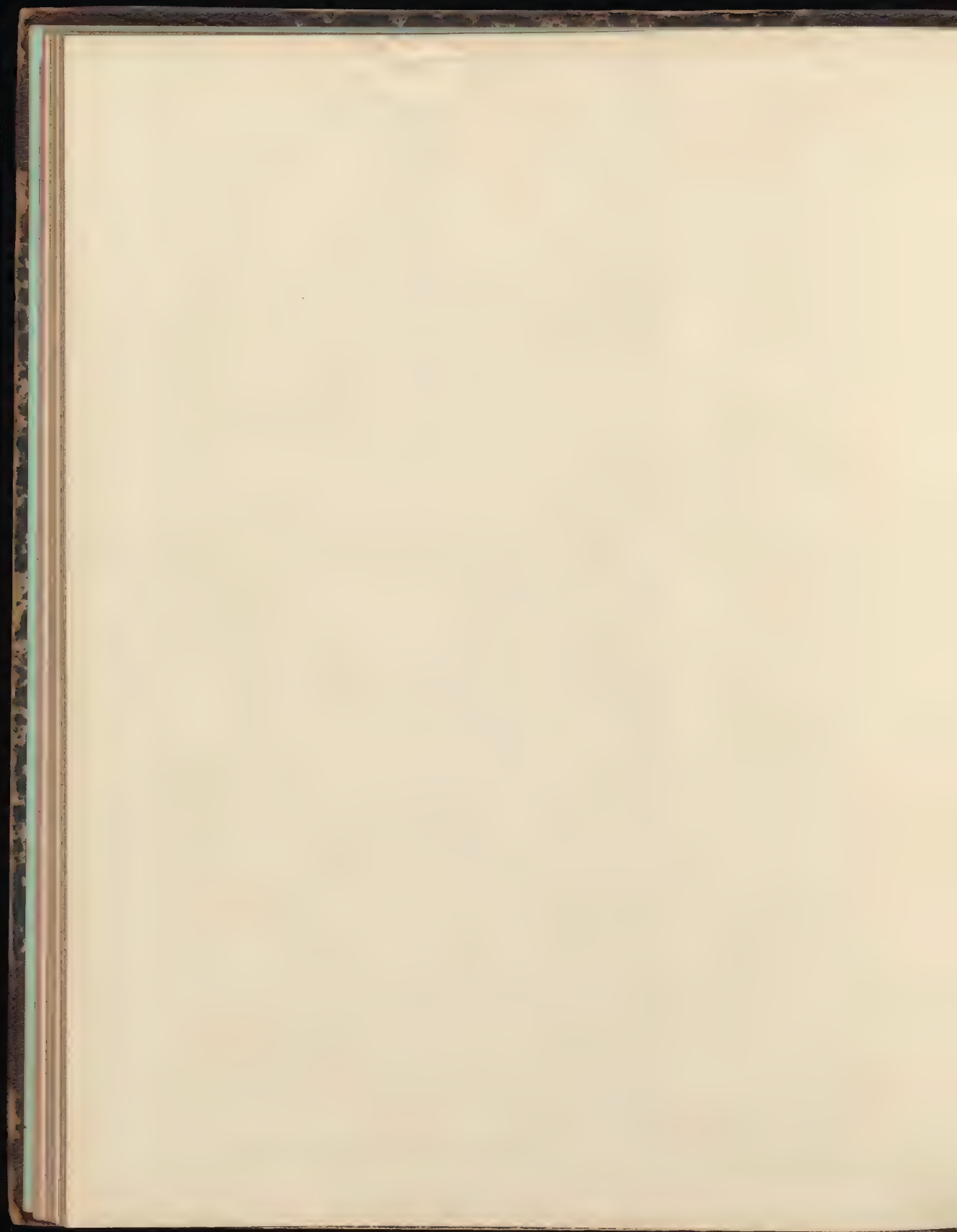
H. & R. T. LORD,

"Journal of Fabrics and Textile Industries" Office,

10, ANN PLACE,

LITTLE HORTON LANE, BRADFORD, ENGLAND.





THE UNIVERSITY OF CHICAGO PRESS, 525 NORTH DEARBORN STREET, CHICAGO, ILL.





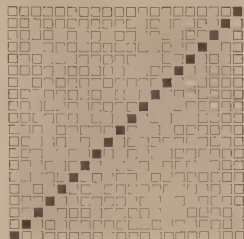
FASHIONABLE * DESIGNS.

Mantle Cloth.

No. 515.



Design.



Draft.

Warp:—

1 end Drab Brown woollen, 22 skeins, 4,040 ends in the
 1 " Light Blue " " " warp; 56 ends per inch;
 2 ends Drab Brown " " " 14's slay; 4 ends in a
 1 end Ficelle " " " reed; 68 picks per inch;
 1 " Drab Brown " " " 72 inches wide in the
 2 ends White " 20 " loom; 56 inches wide
 1 end Drab Brown " 22 " when finished. Clear
 1 " Ficelle " " " finish. Weight 24 oz.
 4 ends Drab Brown " " " White picks where
 1 end Ficelle " " " marked on the right
 1 " Drab Brown " " " hand of the pegging
 2 ends White " 20 " plan.
 1 end Drab Brown " 22 "
 1 " Ficelle " " "

20 ends.

Woven:—

1 pick Drab Brown } 6
 1 " White } times.
 1 picks Drab Brown.

Pegged to fall.

Blue and White ends to
 be where marked in the
 draft.

16 picks.

Worsted Suiting.

Warp:—

2 ends Dark Maroon worsted 2/18's.
 16 " Dark Brown worsted 2/56's.
 2 " Dark Brown worsted 1/56's,
 twisted to Light Brown }
 worsted 1/56's. } 7
 2 " Black worsted 1/56's, } times.
 twisted to Light Blue }
 worsted 1/56's. }
 2 " Dark Brown worsted 1/56's twisted
 to Light Brown worsted 1/56's.

Woven:—

30 picks Dark Claret woollen 9's.
 2 " Dark Maroon worsted 2/48's.

7,020 ends in the warp; 108 ends per
 inch; 27's slay; 4 ends in a reed; 70 picks
 per inch; 65 inches wide in the loom; 56
 inches wide when finished. Clear finish.
 22/3 oz. per yard when finished.

Pegged to fall.

Straight Draft.

Cheviot Suiting.

Warp:—

6 ends Blue cheviot, 18's woollen.
 1 end White 12's twisted to Orange 24's } 8 times.
 1 " " 12's " " Tan 24's }



Plan.

Woven:—

1 pick Black, 18's cheviot.
 1 " " 12's, twisted to Green 24's looped.
 1 " " 18's cheviot.
 1 " " 12's twisted to Crimson 24's looped.

1,572 ends in warp; 24 ends per inch; 24 picks per inch;
 8 heads; 10's slay; Blue—3 ends in a reed; twist 2 ends in a
 reed; 64½ inches wide in the loom; 54 inches wide when
 finished.

Blue, 2 ends worked as one end all through Draft.

Straight Draft.

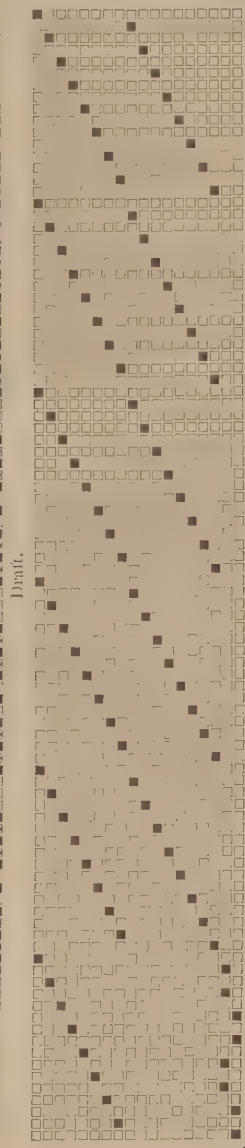
Cheviot finish.

Weight about 20 ozs.

Worsted Trousering.



Design.



Draft.

No. 518.



Pegging Plan.

4,760 ends in the warp, viz.:— 2,380 ends for the face, and 2,380 ends for the back; on 2 beams,
 18 shafts, cross-drafted; 140 ends per inch; 17½ slay; 8 ends in a reed; 34 inches wide in the loom;
 weft, Black worsted 2/44's; 64 picks per inch; 23 inches wide when finished. Finish clear and
 smart. Weight 10½ oz.

Warping or dressing for the face:—

- 8 ends White worsted 2/44's.
- 1 end Crimson worsted 2/44's.
- 9 ends Light Smoke worsted 2/44's.
- 2 " Pearl silk 2/50's.
- 6 " White worsted 2/44's.
- 4 " Brown Drab worsted 2/44's.
- 6 " White worsted 2/44's.
- 2 " Pearl silk 2/50's.
- 9 " Light Smoke worsted 2/44's.
- 1 " Crimson worsted 2/44's.

48 ends per pattern in the face.

Warping or dressing for the back:—

- 8 ends White worsted 2/44's.
- 11 " Light Smoke worsted 2/44's.
- 7 " White worsted 2/44's.
- 4 " Drab Brown worsted 2/44's.
- 7 " White worsted 2/44's.
- 11 " Light Smoke worsted 2/44's.

48

Draw the silk ends, and also the Crimson ends, where indicated in the Draft.

MACHINERY, &c.

Fox's Improved Draught-Board for Milling Machines.

An improved draught-board for milling-machines has recently been patented by Messrs. Wm. Fox & Co., Standard Works, Kirkstall Road, Leeds, which is rather simple in its mechanism. The drawback to the draught-boards as used generally by manufacturers of woollen cloths is that they have a decided tendency to chafe the fabrics as they undergo the operation of milling and, in consequence, more or less "flocks" are made, the quantity varying with the amount of friction experienced, and also with the quality of cloth being operated upon. With the use of the improved mechanism, which can be applied to all existing draught boards at a small cost, it is guaranteed that the making of flocks, and the damaging of fabrics



generally, are reduced to a minimum, as the friction is almost obviated, and by this a considerable economy is effected, and goods are much better milled than is the case where the old pattern of draught board alone is used. From the illustration, it will be seen that the draught-board is such a one as is in general use, being simply a board with oblong holes, through which the fabrics run. On the under side, a revolving roller is fixed in such a manner that the front of the roller is brought slightly in advance of the head of the oblong holes. The cloth in operation first comes in contact with the roller, causing it to revolve, it then passes through the holes in the draught board without the friction generally caused by this operation. This is obviated by the revolving roller keeping the fabric from chafing against the head of the oblong holes. Those manufacturers who use this class of machines will see the advantage of this contrivance and its simplicity. Particulars and prices can be had by applying at the above address.

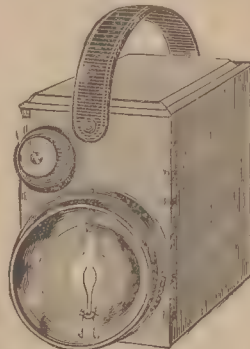
Ashworth's Patent Compound Mule.

An invention which will be of the utmost advantage to spinners of worsted, cotton, silk, and other yarns, is being exhibited at the works of Mr. Richard Threlfall, Machinist, Bolton, and those firms who are considering the question of widening mills and re-fitting with new machinery, so as to increase the number of spindles and the power of production, will be amply repaid by a sight of Ashworth's patent compound mule. The mule is much shorter than those in general use, and consists of a novel arrangement of spindles and fallers only, yet all through, with the exception of the headstock, it is entirely different in appearance from existing machines. To begin with, the creel is an ordinary welt one, inch space rollers, double roving to each end, and single boss rollers $\frac{1}{4}$ in. traverse. The mule at present at work is designed for Bolton counts only up to 60's, which, of course, will do equally well for Oldham counts where a less creel is required. The spindles are very strong— $17\frac{1}{4}$ inches long, 9 inches out of the bolster, with 1 inch wharves, space 2 inches, difference in heights of spindle points $1\frac{1}{2}$ inches, to allow fallers to work independently of each other. The extra row of spindles, or the row the furthest from the rollers, is placed $\frac{1}{4}$ inch out of centre to the left, to prevent the ends, when breaking when the mule carriage is out, from flying on to the yarn of the front row of spindles. The bevels are suitable to the topping of each row of spindles. The speed of the tin roller is 1,200 revolutions per minute, and the spindles 7,500 revolutions per minute, which is a nice speed for 60's twist. The coping fallers are connected by levers on each side of the headstock, the

rods which originally crossed the headstock being done away with. The levers on the coping fallers are connected by adjustable right and left screws with lock nuts, though these are not really necessary, and may never be used in 10 years' working. Still they are there if required. The under fallers are loose, and are released by suitable levers. The mule as at present working is beating the ordinary 13 in. space mule, which is working on the other side of the headstock, by 37 per cent., and makes cops 8 in. long and 13 in. diam. worth 5 per cent. more money than ordinary cops. The mule carriage is fitted with a skeleton spindle box open underneath to allow of the spindle bands being put on the front row of spindles without having to be tied on the tin roller. To oil the front top bolsters, there is an automatic oil can operated by clockwork and about 8 in. long, which travels on a rail, fitted on the inside of the mule carriage, at a uniform speed, oiling continuously or otherwise at will. The clockwork can be arranged to travel the oil can at any desired speed. The wharves on the extra row of spindles are about 4 ins. further from the tin roller than the ordinary row, which makes no alteration or variation in the speed of the spindles. According to indications, both rows of spindles make the same number of revolutions per minute, and the variations in counts and strength from various testings prove without doubt that the cops all through vary no more than the cops on the old-fashioned mule, and it is guaranteed that all cops will be alike if the bobbins are alike, but this is talking of the impossible. The inventor claims that he has kept to the old principle of spinning, as invented by Samuel Crompton 100 years ago, and, besides the principle being a correct one, he claims that for the counts for which the mule is designed, as it is at present running, and from its results and working, it is, and must be, after being rebuilt four times in 43 months, mechanically perfect. For fine counts, say 200's, the usual alterations of heights, bevels, &c., will have to be made, but what the ordinary spindles can spin, the inventor maintains that the extra row of spindles can be made to do the same. If the bevels can be adjusted for 60's, they can be adjusted also for 200's, as the heights and bevels are mere nothings, $\frac{1}{4}$ in. bevel either way will make no difference, the underfallers equalising both.

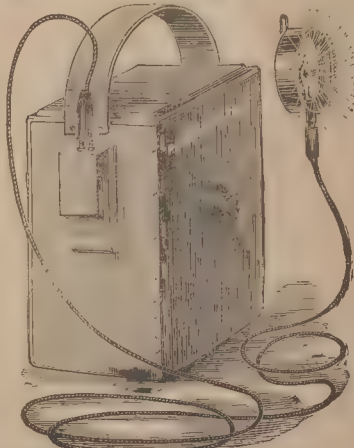
A New Portable Electric Lamp.

Our attention has been called to an electric lamp of novel construction, which is being supplied by Mr. Joseph Edmondson, 36, Sunbridge Road, Bradford. We append engravings of two forms in which these lamps are



made. One is furnished with a strong leather handle across the top, whilst the other is so arranged as to be easily slung over the shoulder by means of a strap, this being specially intended for a travelling lamp. In other particulars the lamps are almost identical. When the cells are fully charged, a light of four candle-power will burn from twelve to eighteen hours, according to the degree of incandescence at which the lamp is burned. This can be conveniently regulated by means of a switch, which not only turns the light on and off, but, by sliding over a platinoid wire of small diameter, inserts more or less resistance in the circuit. The glow lamps are of the Swan type, and are so arranged that they may be either suspended in the reflector, or attached to the end of a wire, and may be changed from one to the other position almost instantaneously. The weight of the lamp, case included,

is about seven pounds, and the cost of re-charging is about sixpence, thus an electric light of four candle-power may be burnt for, say, eighteen hours at a very trifling outlay. The various uses to which a lamp of this description may be put are more numerous than will appear at the first glance. Its perfect safety recommends its adoption for use in mines. For factories, it should supersede all other lamps, as it can be conveniently carried about, and the lamp being attached to a wire, the light can penetrate to the interior of the most intricate machinery with perfect safety, this being a particular feature when taken in connection with the repairing of machines. Further, they could be used by watchmen with great advantage. For railway travelling, they are useful, as

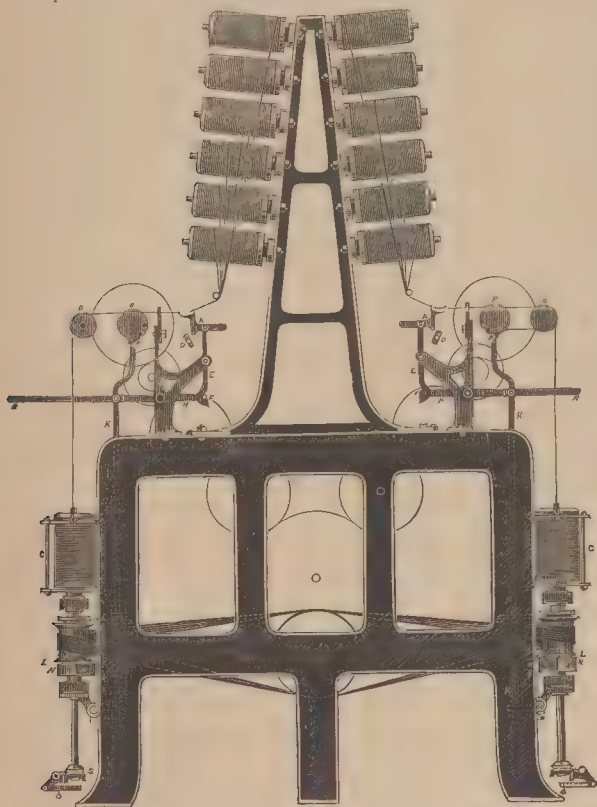


the light can be suspended in any position—say, from a button hole of the apparel of the traveller, insuring a certainty of reading comfortably in any carriage. They are also useful for private carriages, and for domestic purposes generally.

New Stop Motion Twisting Frame for Heavy Yarns.

G. H. HOLDEN'S PATENT.

We beg to call the attention of twine manufacturers to the special advantages secured by Messrs. G. H. Holden and Co.'s stop motion heavy twisting frame for jute, hemp and flax. This machine, as will be seen from accompanying drawing or diagram, has many advantages, as it dispenses with the general system of winding previous to twisting, and thereby saves the labour and waste of one machine. This is done by putting the spinning bobbins in the creel, up to six in number, and running them direct round the cone rollers on to the bobbin below, which is carried by the front spindle. The spindle, with its corresponding cone rollers, is stopped instantly when any one of the ends breaks in their being delivered from the bobbins in the creel. The patent thread guide lever is so constructed as to present a broad surface to the yarn, thus preventing the loose fibres adhering to it, and robbing the yarn of that which should pass with it on to the bobbin and be secured in the twist. The absence of this is a great evil in the machines used at present, the fluff often blocking the eye of the detector wire, causing waste and stoppage of spindles, whilst the improvement ensures for this invention a greater production and more evenness to the thread produced. There is a special clutch wharve of peculiar construction, which is put in and out of



gear in the action of stopping and starting the spindle, which is attached to the wharve. The frame is very strong and well built, each spindle being driven by a belt from $1\frac{1}{2}$ to 2 in. wide, and we have every confidence in recommending the machine to all interested. The bobbin is fixed on a long steel spindle, lifted by a rail, on which are fixed a drag pulley and lever for each spindle, which is easily adjustable, the flyer revolving in a fixed rail, and the bobbin rising and lowering in the process of laying. The machine can easily be understood by reference to the following sketch:—A is one of a number of thread guides or levers, each thread holding up its own guide on its way round the cone rollers B, to the front bobbin C. When any one of the single ends breaks, or a bobbin runs empty in the creel, its thread guide falls and comes in contact with the wiper shaft D. The thread guides are carried by a rocking bracket E, thus, when the wiper shaft D comes in contact with the thread lever A, the rocking bracket E is pushed backward, drawing the bottom part forward off the peg F, which is attached

to the lever H; when the rocking lever E is freed from the peg F, the spiral spring at bottom of rod K presses the rod upward, lifting the clutch out of gear at L, also pressing the lever brake M against the lower part of the wharve at N. This is effected by the action of the inclined plane O coming in contact with the small bowl at the top of brake lever M, instantly stopping the spindle. The motion of the rollers B is also arrested by the lifting of the rod K at the same time, bringing the end of it in contact with the clutch P, which instantly stops the rollers. When the attendant has pieced up the broken end, or replaced the bobbin in the creel, the lever end R is pressed down, thus allowing the rocking bracket E to fall into position, when it is secured by the pin F. The arrangement for obtaining the drag, which may be regulated as desired, may be seen by referring to sketch at S. This firm also make a much smaller machine for cotton, silk, fine flax, woollen and worsted, for particulars of which see advertisement on cover. The machine can be seen at work with six spinning bobbins of 1lea hemp yarn in creel, with stop motion to each bobbin, at Messrs. G. H. Holden and Co.'s Exhibition Rooms, Carr Street, Blackfriars Street, Manchester, five minutes' walk from Victoria and Exchange Stations, and two minutes from Exchange.

Samuel Roberts' Improved Card Clothing.

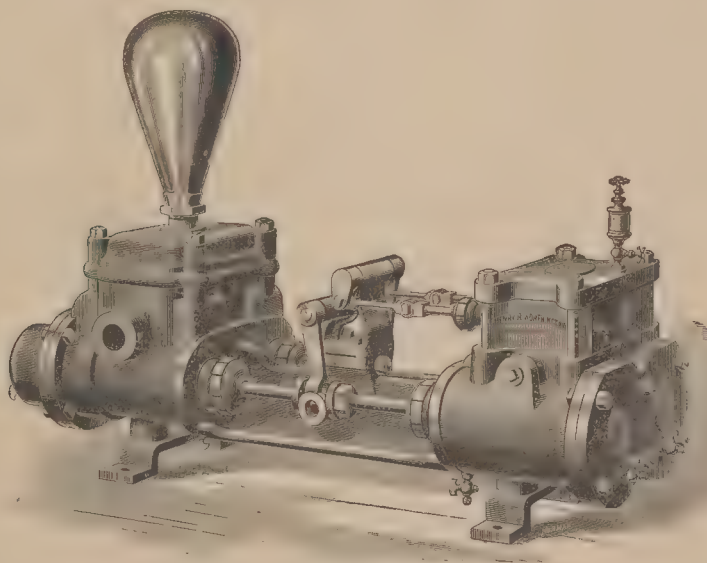
There have been many improvements in the foundations for card clothing put before users during the past few years, possessing, on the whole, many advantages over those formerly in use. Leather, although still the most suitable for certain classes of work, has been to a considerable extent, and for various reasons, superseded, and with, in the majority of cases, satisfactory results. Woven foundations have come to the front, but these have laboured under certain disadvantages, not the least of which is that after a time, however well put together, there is a tendency to stretch or elongate, and this causes what is technically termed running, with the consequent result of bad carding and occasional breakage of the other cards, ending in pecuniary loss to the manufacturer. To obviate this disadvantage, Mr. Samuel Roberts, cardmaker, Cleckheaton, has patented an improved foundation which will be found to be efficient in its work. He has accomplished his object by first having the best texture of cloth for his foundations, in the weaving of which a number of metallic wires are run in lengthwise of the clothing, really acting as part of the warp, thus adding considerably to the strength of the cloth, and, at the same time, rendering stretching, running, or breaking, an almost utter impossibility. Other advantages gained by the use of this improved foundation will be obvious to all using cards:—It is guaranteed to make an improved carding, owing to the cards keeping in their proper condition, and they can also be kept in a sharper position. On this improved system, oil has little effect on the foundation, as the wire keeps the latter in its original position. The cards can be set closer where fine work is required, and the clothing has double the strength of that in general use. Another improved foundation of card clothing is being made by Mr. Roberts, which is also patented. It is oil proof, perfectly even on its surface, and of one uniform thickness. It is very elastic, and genial to the wire. Iron and tempered steel wire can be set in the cloth as close as desired, the foundation being specially adapted to various requirements. Samples of both patents can be had of Mr. Roberts, who will give users opportunities of testing their merits thoroughly.

Dr. Clayton's Fabric Tables and Apparatus for Calculating the Weights, &c., of Textile Fabrics and Yarns.

Manufacturers, designers, buyers, &c., of different descriptions of textile fabrics, are frequently at a loss to calculate accurately the weight per yard of a given width and thickness of woven material, but Dr. Clayton, a member of the firm of F. and J. Clayton, spinners and cloth manufacturers, of Navan, Ireland, has sent us an apparatus and table, by which calculations can be made in an effective manner, in a minimum of time. The apparatus consists of a handy pair of balance scales, adjusted so that they weigh to the $\frac{1}{4}$ part of a grain, weights from $\frac{1}{4}$ grain upwards, a steel die, and a book of tables. The tables give the weight per yard of any fabric from 17 to 80 inches in width, and also the weight of warp and weft therein. The steel die, which is one standard inch square, has sharp edges for the purpose of cutting the cloth accurately. The operation is performed in the following manner:—take a piece of cloth and lay it flat upon a piece of lead or solid wood, place the steel gauge knife upon it, and with a mallet or hammer, strike the knife a sharp blow, the required square inch of cloth is thus cut, it is then weighed, and suppose it weighs $4\frac{1}{2}$ grains, and the width of the cloth is 54 inches, we turn to the book of tables and find $4\frac{1}{2}$ grains per square inch at the head of page 37, and opposite 54 in the column of widths we find 20 ounces 240 grains, which is the exact weight of the yard of cloth. The warp and weft calculations are found in like manner, by simply unravelling and weighing each yarn separately. For example:—The piece already cut to a square is unravelled, the warp being put on one pile and the weft upon another; the former is then weighed and, suppose it weighs 24 grains, this we find at the head of page 20, and on looking opposite 54, the width of the cloth, we find 11 ounces and 47 grains as weight of warp. The weft is then weighed in a similar manner, the figures looked for as for the warp, with an equally satisfactory result. This mode of calculating, owing to its ease, simplicity, and accuracy, should recommend itself to everyone engaged in the manufacture of fabrics, especially as the apparatus and table are to be had at the low price of ros. 6d., post free. We commend it highly, as we have tested the tables for various cloths, and found them correct. Orders for the apparatus can be sent to us with remittance. Address H. and R. T. Lord, 10, Ann Place, Bradford

The Worthington Steam Pump.

We have, on one or two occasions, referred to the subject of steam pumps in our columns as being of special interest to many engaged in the textile trades, and it is with pleasure we once more bring this subject before the notice of our readers, with special reference to that type known as the Worthington Pump. Mr. Henry R. Worthington, of New York, made the production of an efficient and scientific pump the study of his life, and during 1840-4 he contrived, and patented, his first direct-acting steam pump as applied to boiler feeding, and, since that time, his firm have continued to devote themselves exclusively to the manufacture and development of this type of pump with great success, and those of our readers who saw these pumps at work at the Manchester Exhibition will agree with us in saying that they represent a combination of simplicity and efficiency difficult to surpass. As it now stands, the Worthington steam pump is a modification of the direct-acting pump and secures all the advantages of the fly-wheel pump, as well as of the direct-acting pump, while it possesses many other advantages. On reference to our illustration, it will be seen that it consists of two direct-acting steam pumps, without crank or fly wheel, placed side by side, having the valve motion so arranged that the piston rod of the one pump, by direct positive motion communicated through a swinging lever and bell crank, operates the steam valve of the other. By this combination, the piston rod of the one pump travels in a direction opposite to that of the other, and, consequently, one or other of the steam valves is always open to steam, immediately on the admission of which the pump will commence working, no matter how long it has been at rest, nor at what point of the stroke it ceased working; there being thus no dead points in the stroke,



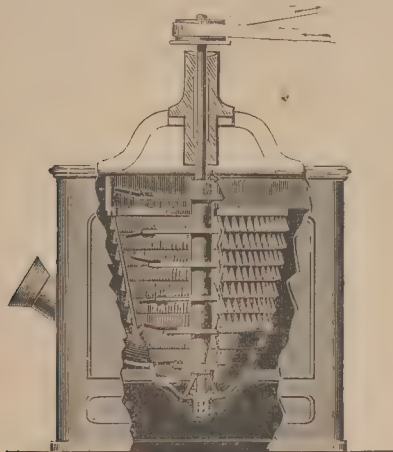
there is no possibility of the pump at any time sticking on the centre. At the end of the stroke, each piston makes a perceptible pause, which enables the valves to seat themselves quietly, and avoids all vibration or shock, at the same time retaining all the water displaced by the plunger during its stroke. The pumps, therefore, work with great economy of power, and the wear and tear are much reduced; there is, therefore, less risk to pipes and other connections. The weight and friction of the moving parts are reduced to a minimum, which secures economy in the steam used to overcome the resistance of reciprocating parts, and also the application of practically the whole force and elasticity of the steam to the water column. The steam valves are the ordinary slide valves, the pump plungers being of the internal plunger type, working through a broad brass ring, and are double acting, so as to secure a continuous and uniform discharge of water. The water is taken in the most direct way through the pump cylinders, which are of large area, and so constructed as to contain a subsiding chamber in which any grit or sediment that may be in the water collects. The pump valves consist of a number of small valves composed of gun metal, rubber, or composition, according to the nature of the liquid to be raised, the lift being regulated by brass springs. The pumps are compact, self-contained, require little or no foundation, and can be used in any given position. All the parts are made so as to be easily accessible for inspection or repairs, and, being made to gauges, can be replaced without trouble or delay, each part being detailed and numbered in the catalogue issued by the Worthington Pumping Engine Company. The Worthington pumps have for many years been favourably known in the United States, where about 50 per cent. of the whole domestic water supply passing through pumps is pumped by them. They are exclusively applied on the petroleum pipe lines of the National Transit Company, on which they serve over 1,800 miles of pipe

against a pressure as high as 1,500 lbs. per square inch. As fire pumps for high speeds, the Worthington pumps are found to be particularly applicable on account of their uniformity of speed, and silent and reliable action. A special application of the Worthington pump is found in connection with automatic sprinklers. For this service, and also in connection with fire hydrants, an automatic steam regulating valve is provided, which is worked by hydraulic ram loaded by springs to the pressure in the water mains. On the slightest variation of that pressure (communicated to the hydraulic ram by a small pipe coupled to the main), the steam valve is opened or closed. If, for instance, a sprinkler or hydrant were opened, the pressure in the water main would be reduced, the hydraulic ram would open the steam valve, and the pump would start without assistance from the attendant. The principle of this pump, by securing perfect absence of all dead centres, combined with thorough reliability, admirably meets the necessities of this service, and, hence, the Worthington pump is accepted by the Insurance Companies to provide a secondary water supply. There are many other services to which these pumps have been successfully applied, such as the supply of water to dye works, bleach works, print works, chemical works, breweries, tanneries, &c., boiler feeding, and working accumulators, hydraulic presses, draining collieries, mines, &c., each different service requiring modifications of detail, which do not affect the principle, and do not at present concern us. It only remains for us to say that, on the introduction of the Worthington pump into this country, Her Majesty's Government ordered them for the supply of water on the Suakin-Berber railway. As indicating the success which these pumps have met with, we may say that over 25,000 are now at work, the average monthly production being between 400 and 500. The company have offices in Birmingham, Manchester, Newcastle-on-Tyne, Glasgow, Cardiff, and Swansea, in addition to the principal one in London.

Crighton and Sons' New Patent Opener.

We recently had an opportunity of inspecting Messrs. Crighton and Sons' new patent opener. This firm has so long been associated with the opening and cleaning of cotton and other fibrous substances that they need no introduction to our readers at our hands. The great objects sought to be obtained in the opening and cleaning of cotton is fleeciness of staple, with a minimum loss of fibre, and the total extraction of dirt, leaf, and all extraneous matter. The introduction of the "Crighton" opener, about the year 1861, produced quite a revolution in this direction, and it is only fair to state that whilst Messrs. Crightons' invention of 1861 was so great an improvement in its day, the present one carries with it equal merit over all openers now in existence. When the "Crighton" opener was first brought before the notice of the public in the year afore-named, the upright conical beater was surrounded by a series of wrought iron grate bars, supported at the base on a cast iron dish or circular casing, around the lower part of the beater, into which the cotton was fed through a funnel passing through the outer casing of the machine. Many were the experiments and changes from time to time made by Messrs. Crighton in the formation and construction of the bars surrounding the beater, but, for many years past, a series of cast iron grid plates surrounding the cylinder have proved by far the best arrangement. These plates really consisted of a series of bars, in shape somewhat similar to the wrought iron bars previously employed, but tied together by cross pieces, forming the spaces betwixt the bars into slots from about 1½ in. to 2 in. in length; these spaces or slots were made very wide at the lower end of the grid, to allow of the extraction of the coarser extraneous matter, and as the cotton, in its upward passage, became opened, the spaces were made proportionately finer to prevent the escape of good fibre. It will be obvious to the practical mind that, the wider the spaces betwixt the bars, the better the result so far as the cleaning is concerned, but the difficulty of having the spaces sufficiently wide to extract all that is desirable from the cotton consists in the self-evident fact that the wide space through which the dirt should be extracted is also available to the passage, and consequent loss, of good fibre, and it is to obviate this difficulty that the present invention exists. In Messrs. Crightons' new patent, the bars are placed so wide apart that a very much greater quantity of dirt, seed, leaf, and other extraneous matter is allowed to pass away from the cotton, whilst, at the same time, the objection which made such a course hitherto impossible is overcome in the machine before us by carrying, from bar to bar, a shield or series of shields constructed as shown in sketch appended, which shields open outwards and downwards, with large openings at the bottom of each to allow the dirt to pass away, and to form thereby a series of slides or shoots, down which the seed and dirt are expelled. As the cotton is driven from the beater blade at a tangent, it is evident that, owing to the considerable distance at which the striking edges of the bars are apart, the cotton will be driven against the face of the bar instead of against the edge as formerly, as may be seen by reference to the sketch, thus giving a blow which is more effective, both as regards opening and cleaning, and is in no way liable to damage or curl the tenderest and longest staple. As the material rises on the face of these bars, the shields inclining upwards and inwards bring the material, at the top of each shield, again to the face of the bar, when it is again operated upon by the action of the beater. The cast iron dish or circular casing upon

which the foregoing grids are supported has hitherto been made without openings for the expulsion of dirt, but, in the present arrangement, this dish is cast with shields and openings at the bottom of each, precisely as in the grids above, so that not only is a very large amount of dirt got out of the dish, where none was ever got out before, but the principle upon which the grids and dish are constructed is found in practice to so enhance the cleaning power of the machine, whilst at the same time it reduces the loss of good fibre to a minimum, that better cleaning and opening of the fibre, with this system, induces such efficiency in the spinning process, that incredible as it may appear, we are told that instances are not wanting wherein an extra turn off of $1\frac{1}{2}$ per cent. of yarn has resulted from the



application of this principle, in addition to which it is said to be cleaner. In the illustration herewith appended, the upright cylinder only is shown, and not the delivery apparatus at all: the machines, we understand, are made with an automatic feeding table, and are arranged to deliver cotton loose on the floor, or to have a lap machine attached to them, in which case the laps are either taken to the finisher lap machines, or direct to the carding engines, according to the class of material worked. It speaks wonders for the merits of this invention, that, although it was only placed on the market early last year, we understand from Messrs. Crighton, there are already nearly 200 machines at work on this principle.

The American Woollen Trade.

(From our own correspondent.)

The market for woollen goods in Boston, New York, and Chicago continues steady, as a rule, with prices firm at opening figures, although, when the prices of the raw material are compared with last year's rates, the manufactured goods are about the same. In men's wear in fancy suitings, orders are good and satisfactory to all concerned, the mills being kept very busy. The call is for modest shadings in the cheap or lower grade of goods, but for the finer grades of cassimeres, fine grey, blue, brown mixtures, in checks and stripes, the ground work being relieved by fancy yarns, such as knobby silk and worsted twists—these are all the go, with a firm market, showing no signs of weakening. Cheviots for summer wear are booming, and many orders are being taken for heavy weights in these goods for next fall and winter use, the summer weight being from 16 to 18 ounces, and the fall and winter 20 to 24 ounces per yard, 6/4 wide—the outlook for these goods is very encouraging to manufacturers, and will prove a bonanza to those who have had the lead in worsteds. Diagonals and corkscrews are all the rage, and the reason for this is that they never were so cheap. The import is immense, and a great volume of business is being done, and at a price which is ruinous to the home manufacturer; there will be a remedy for this in the near future, undoubtedly worsted will be scheduled at the same rate of duty as woollens, and the many mills now idle will be set in motion, for America will not go in for free trade nor fair trade, she will have protection: this is the plain, honest and candid truth, and, perhaps, those interested in the export trade may take timely warning. For ladies' dress goods—all-wool, in solid colours and plain weaves, are now in great demand, the shades being mostly drabs, browns, blues, and maroons, with a few sprinklings of mixtures.

Worsted dress goods are also in good request, 6/4 goods weighing from $4\frac{1}{2}$ to 5 ounces per yard, in checks, stripes and solid colours, with fancy weaves, are the favourites. Worsted and jacket cloths, in checks and stripes, are doing well, and jacket cloths in solid colours, steam finish, weighing from 10 to 18 ounces, in coarse and fine stocks, find a ready market. Overcoatings are moving freely for next winter's use, and large orders are being placed, both for cheviot finish and smooth cloth finished goods. Good beavers in dark green, dark brown, and indigo blues, weighing from 22 to 28 ounces, and chinchillas from 26 to 32 ounces, got up with taste, are in great demand. Prices are firm. In hosiery and underwear not much is being done at present, the market is simply overstocked. Wools are firm, the tendency being upwards in prices, coarse cheviot wools, and the finer grades being most in demand. The amount of wool grown in this country for 1887 is 333,500,000 lbs., or within $\frac{1}{4}$ of the consumption.

Finishing Cotton Velvets and other Piled Fabrics.

An improvement relating to the finishing of cotton velvets, and other similar cotton piled fabrics, whether the same be dyed or finished on the face by the process known as "painting," has been patented by Mr. R. Collinge, of Sowerby Bridge, near Halifax. The object of the patent is to the appearance. It consists principally in fixing the colour and improving the appearance of such dyed or "painted" cotton piled fabrics by the application of a very thin coating of shellac or of other suitable spirit varnish. After the goods have been dyed or "painted," brushed and dried, a very thin solution of the varnish is applied to the surface of the pile by means of a roller engraved on the face with very fine lines, after which it is brushed and finished in the usual manner. The application of varnish fixes the colour and imparts an increased lustre and depth thereto.



ODDS AND ENDS.

The Czar has commanded the Minister of Public Instruction to present to the Council of the Empire a bill for the establishment of technical schools throughout Russia. There is some opposition to the measure, but it is thought that it will be adopted.

The French *Journal Officiel* for 22nd January last states that the Commission appointed by the French Minister of Agriculture to inquire into the cultivation and employment of ramie has reported that the best way in which to procure the necessary quantity of this fibre will be to cultivate the plant close to Paris, and it has recommended the Government to utilise for this purpose the estates at Gennevilliers, the fertility of which is a guarantee of the success of the experiment.

The conference of the delegates of the Cape Colony, Natal, and the Orange Free State, which has been sitting in Cape Town for three weeks, under the presidency of Sir Gordon Sprigg, to consider the question of the inter-colonial railways and customs union, have unanimously agreed to a report recommending the establishment of a South African Customs Union upon defined lines, and also the extension of the colonial railways through the Free State to the Vaal river, the extension to be undertaken by the Free State Government.

The greater the efforts which are being made to dispute the popularity of tricot bodices, says *Kuhlow's Gazette*, the more the Chemnitz manufacturers in this particular branch strive to produce novelties. Ribbed goods, and narrow-striped articles with the new knot stitch are now being brought upon the market. The knot stitches have produced zig-zag patterns. Tricot stuffs, with raised mohair knots, and with smooth narrow-striped and mixed close-shorn surfaces, are among the prettiest of the novelties. In addition to these, the pea and ray patterns are being produced on tricots, whereby a large new field is opened out to this material. The demand for tricot stuffs in England and America is still increasing, for numerous after-orders have come in. The Saxon worsted spinners are looking very black at the proposed increase of the freightage for sliver. Saxony consumes about 14,000,000 lbs. of sliver yearly, which she receives mostly per rail. An increase of freightage would be particularly hard at the present time, for the worsted spinners are scarcely in the position to reckon the difference on their yarn prices. The Chemnitz Chamber of Commerce and Industry has, therefore, requested the general managers of the Saxon State Railways to exert their influence against the increase in question.

PATENTS.

Applications for Letters Patent.

Automatic yarn and thread spooling machinery. J. Holroyd and H. Liebert, Manchester.	28th Jan.	1,300
"Acme wool cleaner" for cleansing textile fabrics, applicable to the cleansing and recovery of oils and fats. J. Singer and M. W. Judell, London.	20th Feb.	2,532
Brakes applicable to warp beams of looms. D. and W. A. Crabtree, Bradford.	28th Jan.	1,299
Bobbins for ring spinning machines. H. Taylor, Manchester.	31st Jan.	1,424
Belt or strap fasteners. J. S. Crowley, Manchester.	10th Feb.	2,009
Block printing machines for oil-cloths, &c. N. L. Tuck, London.	14th Feb.	2,249
Backing or foundation of cards for carding machinery. G. Martin, London.	14th Feb.	2,255
Back washing machines for fibres. J. C. Walker, London.	22nd Feb.	2,642
Construction of carding engines. G. and E. Ashworth, Manchester.	2nd Feb.	1,547
Chronographic mechanism for recording arrivals and departures of workmen. A. Dey, Glasgow.	3rd Feb.	1,614
Cage or receptacle for use in treating Ramie, China-grass, and other analogous fibres. H. M. Girdwood, Manchester.	4th Feb.	1,675
Composition rollers for use in spinning and other machinery. J. F. Haskins, London.	6th Feb.	1,736
Check straps for looms. H. Smith and G. Fishwick, London.	14th Feb.	2,209
Carding engines for cotton. T. Forknall, Manchester.	15th Feb.	2,281
Constructing under pickers for looms. T. B. Hamilton, Belfast.	17th Feb.	2,389
Cotton gins. A. M. Clark, London.	21st Feb.	2,592
Combing machines. J. C. Walker, London.	22nd Feb.	2,643
Carding teeth and carding cloth. H. Gerdes, London.	22nd Feb.	2,669
Construction of picking bands, check straps, and buffer straps for looms. G. Huck, London.	17th Feb.	2,398
"Drop-box" and "pick and pick" looms. M. Sowdon, Halifax.	27th Jan.	1,244
Dividing double pile fabric. W. Smith, Manchester.	2nd Feb.	1,534
Drying, storing, mordanting, or ageing fibrous materials, and apparatus therefor. D. Johnson, London.	7th Feb.	1,816
Driving the cylinders of carding engines. S. Tweedale, Halifax.	15th Feb.	2,265
Dividing and delivering in bands the fleece from carding machines. A. Lejeune, London.	21st Feb.	2,610
Drying yarn or thread. J. Y. Johnson, London.	22nd Feb.	2,601
Equalising the feed of fibrous materials to scutchers, openers, and other preparing machinery. E. Buckley, London.	27th Jan.	1,267
Figured quilts and similar fabrics. J. Riley and J. and T. Bond, Manchester.	28th Jan.	1,303
Finishing woven fabrics. W. Robertson and J. G. Orchar, Glasgow.	2nd Feb.	1,553
Flats for carding engines. T. Knowles and R. Tatham, Manchester.	4th Feb.	1,687
Felt stair carpets and squares, and borders for squares. W. Stansfield, Manchester.	7th Feb.	1,784
Fans for exhausting and propelling air. J. and R. Crigh-ton and G. C. Peel, Manchester.	15th Feb.	2,269
Finishing cords and other cut-pile fabrics. J. Worrall and J. Lawrence, London.	13th Feb.	2,168
Grinding carding engine flats. J. Hill and R. and J. Isherwood, London.	7th Feb.	1,811
Grinding the flats for carding engines. J. E. Platt and J. Fiddler, Manchester.	15th Feb.	2,266
Gig mills for finishing woven fabrics. E. Michaelis, A. Smethurst, and C. Wood, Manchester.	20th Feb.	2,498
Heating of steam drying cylinders of sizing, &c., machines. C. Martin and G. Blackshaw, London.	2nd Feb.	1,582
Immersion rollers used in printing, dyeing, bleaching, sizing, &c. T. Winter, Halifax.	30th Jan.	1,357
Jacquard harness looms. J. F. Kirk, London.	31st Jan.	1,440
Jacquard mechanism of looms. E. Hollingworth, Halifax.	11th Feb.	2,074
Jacquard machines for looms. A. Flather, Bradford.	13th Feb.	2,146
Looms for towels and other articles of predetermined length. A. Schotte, London.	18th Feb.	2,473
Let-off motion for woollen and worsted looms. T. H. Brigg, Weston, Otley.	20th Feb.	2,500

Loom temples. W. H. Taylor, London.	23rd Feb.	2,727
Moistening and drying warps in the manufacture of fabrics. W. Pemberton, Halifax.	28th Jan.	1,297
Mordanting and dyeing hanks of yarn, applicable for washing and sizing a certain kind of woollen hank. S. Spencer, London.	9th Feb.	1,954
Method of, and means for, attaching the clothing to carding-engine flats. G. and A. Ashworth, Manchester	10th Feb.	2,011
Method of, and apparatus for, dyeing wool, &c. F. and F. Lee and J. Bradshaw, Bradford.	11th Feb.	2,093
Means or method of producing designs on sealskin, silk plush, astrachans, &c. J. W. Martin, and J. Lockwood, Halifax.	16th Feb.	2,328
Method of, and apparatus for, operating the shafts and heads of looms. W. H. and B. Hudson, London.	22nd Feb.	2,658
New kind of pile fabric. G. Marchetti and H. N. Mellor, London.	15th Feb.	2,300
Operating jacquard engines. F. Leeming, Halifax.	3rd Feb.	1,611
Protectors, guards, or screens for the prevention of accidents where machinery is in motion. A. and T. Leadbeater, Leeds.	31st Jan.	1,405
Pressers of flyers for slubbing, intermediate, roving, &c., machines for preparing fibres. W. Greenhalgh and I. Bamford, Oldham.	3rd Feb.	1,598
Picker for looms. J. Westley, Farnworth.	3rd Feb.	1,607
Protectors or guards for pulleys, wheels and gearing of machinery. M. A. Bragg, London.	10th Feb.	2,042
Pressure apparatus for cloth finishing and other rolling machines. W. W. Urquhart, J. Lindsay, and R. Allen, Glasgow.	11th Feb.	2,134
Pressing woven and felted fabrics. T. C. Fawcett, Halifax.	16th Feb.	2,339
Plushes. G. Rath, Berlin.	20th Feb.	2,491
Ribbed beavertees. J. R. Hutchinson, Manchester.	28th Jan.	1,311
Reversing the jacquard mechanism in looms. E. Hollingworth, Halifax.	13th Feb.	2,143
Reels or frames for holding pile, &c., fabrics. T. W. Harding, Leeds.	16th Feb.	2,343
Revolving cloth stretchers or similar machines. W. G. and G. P. Gass, Bolton.	21st Feb.	2,537
Self-acting stop motion on doubling frames, applicable on new or old frames for doubling two, three, four, or more ends. G. Peltzer-Teacher and B. Rilke, Manchester.	31st Jan.	1,407
Shuttles for weaving. W. Brown and B. Burnley, Batley Carr.	31st Jan.	1,408
Stop-motions for drawing frames. H. B. Barlow, Manchester.	31st Jan.	1,486
Sliver conductors for drawing rollers. J. Barbour, Halifax.	10th Feb.	2,003
Scribbling and condenser carding engines. T. H. Blamires, Huddersfield.	13th Feb.	2,148
Segment temples for looms. J. Pickles, Bradford.	14th Feb.	2,205
Self-acting mules. S. Burton, Manchester.	15th Feb.	2,270
Shuttles for looms. J. Fenton, Bradford.	16th Feb.	2,346
Shuttles for power looms. W. Dudgeon and G. Thompson, Belfast.	18th Feb.	2,430
Spinning, doubling, winding, &c., machines. W. E. Marchington, Manchester.	21st Feb.	2,535
Scutching machines. J. A. Taylor, Manchester.	21st Feb.	2,545
Shuttles for looms. J. Fairburn and T. Casson, Halifax.	22nd Feb.	2,616
Trap twisting frames for twisting or doubling any number of yarns together. A. Mitchell and S. and C. Longbottom, Low Moor.	3rd Feb.	1,619
Thread winding, ticketing and stamping machines. J. Booth, London.	16th Feb.	2,349
Tension regulating device, applicable for driving cards, tapes, &c., used in machines for spinning, &c. J. W. Midgley, Keighley.	18th Feb.	2,441
Wool-scouring or washing machinery. C. H. Smith, London.	31st Jan.	1,450
Washing, scouring, or fulling cloth, &c. F. F. and M. L. Rohart, London.	31st Jan.	1,464
Weaving damask figures, letters, monograms, in colours on Terry cloth, raised on one or both sides of cloth. W. Cunningham and R. Hutchinson, Dunfermline.	8th Feb.	1,864

Patents Sealed.

13,250	15,747	793	1,118	4,492	4,583	566	1,048	1,255	1,256
1,263	14,406	14,514	739	17,094	1,119	1,221	1,316	1,351	1,372
1,554	1,786	2,215	2,648	3,719	3,839	7,689	9,086	10,425	14,400
14,571	16,173	826	1,287	1,427	1,518	1,617	1,625	4,051	12,797
13,763	14,370	17,024	607	1,974	10,996	11,182	12,169	15,008	15,049
1,215	1,640	1,680	1,737	1,993	2,039	2,229	3,304	4,674	14,238
15,294	755	1,648	1,762	2,030	2,091	2,108	2,146	4,412	12,866
12,968									

The Journal of Fabrics AND Textile Industries.

Vol. 13. No. 80. APRIL 12th, 1888. Price 10d.

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Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office-Orders to be made payable to H. & R. T. LORD, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

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To prevent any misunderstanding, all Articles sent to the Journal of Fabrics and Textile Industries for publication will be considered as offered gratuitously, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the Journal of Fabrics and Textile Industries as the source from whence they obtained their information.

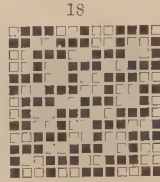
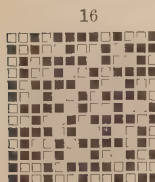
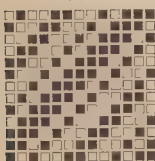


A Foreign Textile Work.

BY MR. ROBERTS BEAUMONT, M.S.A.

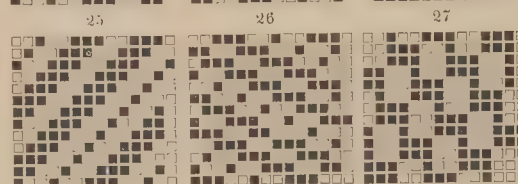
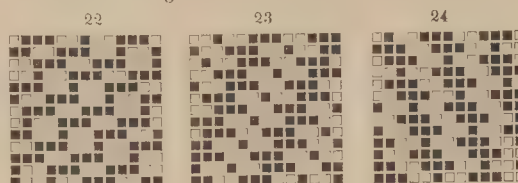
(Continued from page 26.)

An interesting part of the volume is that relating to designs of a combination type. In the first place, attention is devoted to weaves that may be obtained by altering the positions of the threads or picks composing any given crossing. For example, from the 13 shaft twill shewn in Fig. 15, by changing the positions of the threads to that indicated below, the weaves given in Figs. 16, 17, 18, 19, 20, and 21 result.



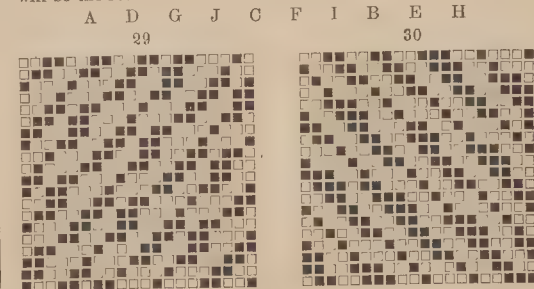
- (a) 1 3 5 7 9 11 13 2 4 6 8 10 12
(b) 1 4 7 10 13 3 6 9 12 2 5 8 11
(c) 1 5 9 13 4 8 12 3 7 11 2 6 10
(d) 1 6 11 8 8 13 5 10 2 7 12 4 9
(e) 1 7 13 6 12 5 11 4 10 3 9 2 8
(f) 1 8 2 9 3 10 4 11 5 12 6 13 7

If the picks instead of the threads are reversed, the series of effects seen in Figs. 22 to 27 inclusive are deduced. Another



principle of producing effect in this class of "chance" combinations consists in regulating the character of the pattern by employing groups or sets of threads instead of treating them individually as in the previous illustrations. Take an example:—in Fig. 28 is furnished a design of an ordinary twill class, which it is required to modify in such a way as to produce another pattern of an unknown, or undetermined, structure, for it is impossible, on this irrational system of designing, to form any idea of what will be the result of transposing the threads of a given crossing until the experiment has been made. Well, supposing, merely for illustration, that the threads are paired thus:—

A B C D E F G H I J
1.2 3.4 5.6 7.8 9.10 11.12 13.14 15.16 17.18 19.20
and then the sets are arranged as follow, the sketch in Fig. 29 will be the resultant.



By simply transposing the threads in each set in the following manner, we get the design furnished in Fig 30 :—


2.1—8.7—14.13—20.19—6.5—12.11—18.17—4.3—10.9—16.15

Theories of this nature may appear plausible and rational enough on a primary consideration, and may possibly be, in certain instances, adopted with a measure of success, but it will be evident to all that the chances of obtaining a well-balanced pattern are on a par with those of winning a game of dice. No doubt, some good effects are occasionally to be formed by this species of manœuvring and dodging, but, as it is a type of designing which substitutes mathematical reconstruction of weave for the exercise of the inventive faculty of the mind, it should not, in our opinion, be practised with too great a liberality. There are other sections of the work on which we might linger, but we must pass on to the subject of colour, with a consideration of which we shall conclude our *résumé* of this—in many particulars—valuable treatise. Thus we regret that space does not permit us to enter into the useful information this work contains on the structure of the various kinds of matelasses, velvets, and other figured fabrics. Though these textures are not elaborately treated of, yet they have received careful examination. Colour plays such an important part in the ornamentation of woven fabrics that any treatise on textiles would be incomplete in which it did not find a place. While we accept M. Lelarge's opinion that "colour, that is the blending of shades and combinations of colours, is a question of taste," yet we consider that there are many principles relating to the production of pattern in woven fabrics based on colouring which require careful handling and clear elucidation. "It is requisite," as the author of the work before us observes, "to have had considerable experience in the manipulation of colours, and to possess a really good natural taste to arrive at agreeable colouring." "The English," he proceeds to state, "have a taste for a species of design, for certain arrangements of colours absolutely different from those of Belgian and French designers. We do not by this imply that the same colouring is not possible in Belgium or France as in England, but to state a well known fact, it is that colour combinations are not made in virtue of general principles, and do not even derive their perfection of composition from their shadings. In a word, the agency of colours is not reducible to fixed laws." There are some parts of this quotation in which we can fully acquiesce. A colourist, as a poet, must be born a colourist, and not made such by training. Those who, by long practice and tedious study, acquire a faculty of writing verses, very rarely produce soul-inspiring poems, tinged with the fire of true poetic genius; nor does the colourist, whose knowledge of harmony and contrast of shades is solely derived from a rigid course of training, attain very brilliant successes in the blending of colours. He may, no doubt, succeed in forming passable combinations, and possibly steer clear of injudicious and incongruous mixtures, but, on the other hand, his works lack a very essential quality—originality. Efficient colourists, possessing a natural faculty for colours, though thoroughly conversant with colour as theorized in modern treatises on this subject, seldom narrow their field of operations to the stereotyped and mechanical regulations recommended in books of this description. New combinations, outside the range of determined laws and principles, are expected from those whose occupation it is to invent novelties in woven textiles, for it is by this means alone that new and cheerful colourings of an original cast, so largely demanded in cloths that find a creditable place in merchants' warehouses, are to be designed. One remarkable fact which tends to indicate that many of the taking and attractive styles, or those patterns which obtain an extensive sale, are not constructed on theoretical principles, or in accordance with the so called laws of colours, is that those designs which appear harmonious in arrangement one season, wear a tone of incongruity and possess a tawdry aspect the next. It would appear from this that the poet's maxim—

"A thing of beauty is a joy for ever,"

is either at times untenable, or that beauty in woven patterns is more or less an optical delusion. True, there are some blends which, like the colourings of the flowers of the field, ever retain their brightness of character and of which the eye never tires, but there are also others, and a somewhat numerous class too, which "fetch" the buyer and are the rage for a period, whose

attractiveness and beauty evaporate with the revolutions of the potent but fickle wheel of Queen fashion. It is as feasible to locate the "Will-o'-the-wisp" as to trace principles in combinations of this order. What course ought therefore to be adopted in relation to colour? To this inquiry there can only be one answer, master as far as practicable the various works on colour, however scientific and inapplicable the theories they enunciate may apparently be to textile effects; also, study Natures colourings minutely, making such notes of gleanings from her pallet as will assist and facilitate the development of patterns by coloured threads, qualifying the mind for the origination of styles tasteful in shadings, rich in blend, and congruous and artistic in arrangement. M. Lelarge does not deal with colour very lengthily. He makes reference to the systems of obtaining pattern in both simple and intricate weave combinations, but his samples are not of a very striking character, nor even in keeping with the high standard of information furnished in some parts of the work. Fig. 31 is a sketch he supplies of a pattern

obtained in the plain cross-
ing by warping :—
81

For { 1 thread of black
8 threads { 1 " " white
For { 1 " " white
8 threads { 1 " " black

The weft to consist of 1 pick black and 1 pick white, alternately. All the illustrations in coloured effects are represented on this crude and inartistic system. Allusion is also made in brief terms to colour as applied to designs for damasks, quiltings, vestings, and dresses, but these sections of the book are not so comprehensively put before the reader as the structure of crossings, which may be said to constitute the leading and distinguishing feature of the volume.

This brief sketch of M. Lelarge's very practical and highly instructive treatise may possibly have served one important purpose—it has afforded us a glimpse of the principles adopted in imparting textile instruction in one of the foremost technical schools on the Continent, and, in these days, when the promoters of trade instruction in this country refer to such schools as models for our imitation, it may be of some utility for us to know, from an actual analysis of the courses in weaving there applied, that our own colleges are not one jot in the rear, but rather, if anything, in point of educational facilities and thoroughness of teaching, in advance of the most completely equipped Continental textile institutions. There is, therefore, rational ground to anticipate that British manufacturers will, in years to come, retain their position in the markets of the world, for if the English artisan only utilizes to the best advantage the facilities for the acquirement of technical and exact information of woven productions now at his disposal and, moreover, brought to his own door, and brings that tact and skill so truly characteristic of his forefathers to bear upon his handicraft, the day is far distant when some classes of the textile products of English looms will be surpassed in excellence and beauty of design, in structure of fabric, in softness of texture, or in lustre of finish, by those of Continental or American manufacture.

Book Notice.

COTTON MANUFACTURING. By C. P. BROOKS, M.S.A.

LONDON: E. and F. N. SPON, 125, Strand.

Although there have been many works treating of the various branches of the cotton weaving industry, still there is room for others of a practical nature. The book before us is not large, yet its pages contain a great quantity of readable matter which, to the technical student especially, will be of much value. The volume includes over 80 illustrations of mechanisms used in the cotton manufacture, and commences with the history, statistics, etc., of the industry, and then follows chapters on the various processes of winding and warping, sizing, and plain and fancy weaving. It also comprises descriptions of the mechanism of the different kinds of looms, with their accessories for the weaving of fabrics, from plain calicoes to elaborate figured goods. There is a chapter on the analysis of patterns and designing, etc., and another upon calculations, including yarn counts, reeds, heads, cost of cloth, warping and sizing lengths, wages, speeds, engines, etc. There is also a glossary of technical terms, as well as a syllabus of the "City and Guilds of London Institute," bearing especially on the cotton manufacture. The illustrations are of machinery of the latest type, and by the leading makers in the textile districts. The work is one well worth the attention of the student and the practical hand, and Mr. Brooks is to be congratulated upon putting before those engaged in cotton manufacturing a manual of such utility.

Carding Engines and their Clothing.

A Lecture given at East Crompton,

BY MR. JNO. BUTTERWORTH, F.R.M.S.

(Continued from page 28).

STRIPPING.

"Just before giving up my occupation in the mill, I had a sample card offered that was to do satisfactory work with next to no stripping or grinding. The card maker stipulated that it should not be either stripped or ground unless one of his own men was there. I took measures to have these instructions strictly carried out, for I well knew that while the card maker was having this test of his card made, he would be unwittingly carrying out an experiment that I was anxious to see tested. To come to the point, however, the test lasted over several weeks, and on one occasion the card ran six days without either stripping or grinding, and, before it was stopped to be stripped and ground, I took six of the last cans full of drawing that the engine had made, and these I put through the drawing frames to the last box. I then put it in comparison with the drawing from the other cards in the same room which had been stripped and ground in the usual manner. The result was that an ordinary person could have picked it out of a dozen samples, it was so different in colour. This experiment ended as I expected it would, but I was anxious to have my opinion confirmed, and I maintain that there has been no improvement, up to the present, in the make of card clothing that renders it safe to lessen the amount of stripping. I grant that some makes of cards, under certain conditions, will run longer without nepping than others. This, I suppose, has led people to think that, so long as a card does not produce nepps, it needs no stripping. You must, however, be aware that all cotton is charged more or less with short and undeveloped fibre, which is either left between the card wire, or it passes on into the sliver, and you will perceive that, if a card run long enough without stripping, its wire becomes felted, full of short fibre, and when no more can be forced in, short and long must then pass on into the sliver, and, of course, it will render the yarn dull and of a different colour to that made where stripping is fully kept up. If you ask me what difference in colour is produced by neglect of stripping to the extent I have named, I answer it is so great that it would bring complaints from any hosiery manufacturer or turkey red dyer, and sufficient to produce pinrows in several kinds of cloth. Much more might be said on this point, but I will leave it and give some time to a description of card teeth cloth," &c. The lecturer having distributed various samples of card teeth cloth, with descriptions, amongst his audience, continued:—"The samples of cloth are such as experience has proved to be necessary for both

HARDENED AND TEMPERED STEEL WIRE,

as well as mild steel wire. Nos. 1 and 2 are plain cloth, which you will notice are widely different in thickness and strength. Such, however, is necessary from the difference in the character of the wire they have to carry, and you will have some idea of the greater rigidity of hard and tempered steel over that of mild steel wire if you have compared those two cloths, but strong as the sample is, I have very serious doubts if a foundation has yet been made that will wear out hardened and tempered steel wire. The foundation often gives way, or else the teeth break off close to it, but, if both foundation and wire should endure, the teeth become still more rigid, rendering it impossible to grind a proper carding point. Now, if we turn to the samples of rubber foundation, Nos. 3 and 4, the same feature is carried out, the cloth for hardened and tempered steel is considerably thicker and stronger than the one used for mild steel. If I had had no former experience of hardened and tempered steel cards, these samples would have been very suggestive, but I have not yet drawn your attention to the irregular temper in this wire. I have never yet seen an engine covered with hardened and tempered steel wire that was of one uniform temper, I believe I tried the second card of hardened and

tempered steel that was made by Daniel Bateman, the man who patented and introduced the wire, but it was of such irregular temper that the teeth stood across each other, and some of the wire was so hard and rigid that it was impossible to grind a proper carding point on it, and, after toiling with it about two weeks, the maker exchanged it for one of ordinary wire. The possibility of ever being able to get steel that will give one uniform temper would seem to be almost hopeless, the uncertainty of which I pointed out in a letter to one of our local papers some time ago. The only steel wire that gives any degree of satisfaction is piano steel wire, but, if it was hardened and tempered, I question very much if it would give the same result. It is made from cast steel, hence it is rather expensive, but it carries considerable elasticity, which is more uniform than hardened and tempered wire. This, no doubt, arises from the greater care bestowed in the manufacture of the steel in the first process. We come now to the enlarged samples of card teeth, and, to continue the question of hardened and tempered steel wire, I shall refer to No. 1 sample as illustrating how hardened and tempered wire is covered with scale produced by the heat it is subjected to before hardening and tempering. The glaring character of those scales on the sample may lead you to think that the fact is exaggerated. If so, I must refer you to a few teeth that I have put up to be viewed under the microscope. They were taken from a sample that has passed round the room, but I am afraid that so large a number as we have present will not be able to see this microscopic preparation. Those, however, who have the pleasure of seeing it will, I think, be fully satisfied. If not, I have a third illustration in a roll of hardened and tempered steel wire, such as is ordinarily used in the make of cards. You shall take that roll and bend it at an angle, such as is formed in making the heel of card teeth when they are being set in the cloth or rubber foundation, and if you take a pocket magnifier and examine the wire where you have bent it, you will find it covered with scale such as you see in the enlarged samples. You may argue that the minuteness of the scales on the wire is a little matter to raise a question on, but I deny that it is a little matter. Those scales are several diameters larger than the average diameter of an American fibre, especially the undeveloped ones, so that they are certain to obstruct the free delivery of the fibre at the proper time. But, again, if it is a little matter that card teeth should in this way be covered with scale, why should card makers be at the trouble to remove it by an attempt to re-polish the wire. The reasons why hardened and tempered steel cards do not clear well are not far to seek, if you choose to be at a little trouble, which I hope we shall be able to show. I had at one time intended to fall back on photography to assist me in illustrating this lecture, but I was not satisfied with the results. Photography does not give as true an idea of the various forms of card teeth or the effect produced by the various modes of grinding as these samples do. You have to draw on the imagination more in looking at photos. If you examine under a moderate magnifying power samples of card teeth, on which an attempt has been made to imitate a needle point, and then compare them with those enlarged samples, I think you will conclude that the samples are not exaggerated. The next sample we shall refer to is No. 2, which represents a magnified view of hardened and tempered steel wire, after attempts have been made to re-polish it by passing it through emery cloth, but, as a further illustration, we have here a roll of the same kind of card wire, as well as samples of ordinary wire, together with a sample of unheated steel wire. I do not think you would need a microscope to enable you to pick out the emery polished wire from the rest, and I wish to impress this fact on your minds, that no attempt which has yet been made up to the present to re-polish hard and tempered steel wire has succeeded in bringing it up to the polish it had when it left the wire drawer, and that is not what ought to be. I think, when users can be induced to investigate these matters for themselves, they will soon see that this coarseness of the wire is another cause why steels cards fill so full of short fibre, and are so difficult to get clear. Following in the same direction, the next three examples, Nos. 3, 4, and 5, illustrate those attempts that have been made to produce a needle point by grinding. The means adopted, however, in my opinion, frustrate the object sought to be accomplished, owing to the rough state in which the sides of the teeth are left, and no amount of

polishing with wire or bristle brush will ever bring them up to the burnish the wire originally had. The specimens we have prepared for the microscope will show that these are no fancy ideas, and every specimen is prepared from the samples which have passed round the room this evening. I feel as if I could hardly lay stress enough on this point, because, for some reason or other, cards do not free themselves of short fibres as readily during stripping or grinding as they formerly did, and these investigations have been made in the hope of arriving at a cause. I have had cards carding upwards of 900 lbs. per week that would come up as clear as a bell, so that you could see the foundation even after stripping, let alone after grinding. It used to do me good to look at them, but I confess I have often been made sick at the sight of a great many modern cards. Often, after grinding an hour or two, they are still so full of short fibre in patches that they look as if they had leprosy. I have seen cards so full as to look as if covered with a sheet of felt. When cards are charged to the very points of the teeth, how can they do good work, and is it surprising that firms who have largely tried hard and tempered steel wire should report that the strength of their yarn went down as they made the change. I wish it to be understood that I have pursued these investigations solely to get at the root of some of the evils surrounding us. I believe that every change that has been made has been done with a view to give us something better, and, for what has been a failure, I do not see who can be blamed. I believe we shall have better results yet in card wire, and I venture an opinion that if hardening and tempering were abandoned, together with side grinding, for the purpose of imitating a needle point, keeping to the purest of steel wire made from cast steel ingots, but drawn down to one or two numbers finer than at present used, we should have better results than we have now. I have always clung to the greater elasticity that is given in steel wire, but I lost faith in hardening and tempering a long time ago.

(To be continued.)

Tokio Commercial Museum.

We insert with pleasure the following letter addressed to manufacturers and merchants, by Mr. Takashi Masuda, managing director of the well known firm of Mitsui and Co., Tokio, Japan, as we believe that it will be read with interest by those of our subscribers who have not previously had an opportunity of perusing it.

To English Manufacturers and Merchants.

GENTLEMEN,—I have the pleasure to state, for the information of English firms now doing, or desirous to do, trade with Japan, that there has been established in Tokio, the capital of Japan, a Commercial College and Commercial Museum. The Museum is connected with the College, and both are under the direct supervision of the Government Educational Department. Up to the present, however, this museum only contains exhibits relating to the productions of Japan, and consequently there is, especially amongst the Japanese commercial community, an earnest desire to greatly widen the scope of the museum, so that it may contain, not only native exhibits but also, exhibits from all the industrial centres of the world. In order to carry out the object in view, it has been recently proposed to sufficiently extend the present museum buildings, to enable them to contain any samples of foreign productions which may be obtained from manufacturers or merchants desirous of permanently exhibiting their goods or machinery in Japan. The extension of the museum buildings having been practically decided upon, I am deputed—as vouched for by the Consul's certificate at the foot of this letter—by the members of my committee, to solicit from English manufacturers and merchants contributions for our Commercial Museum. These contributions may take the shape of samples of raw or finished materials, small machines, models, tools, general appliances, photographs, drawings, maps, plans, sketches, catalogues, price lists, or circulars, all of which will be permanently housed, classified, and exhibited in the museum. In the case of merchantable articles, the current prices should be affixed to the samples. As regards the exhibits of manufactured goods, it would be of great interest and value if the exhibits were grouped and arranged to show the different stages in the progress of manufacture—that is, from the raw material to the finished product. In order to prevent a repetition of exhibits, intending exhibitors are requested to communicate with the London branch of my firm (Messrs. Mitsui and Co., 1, Crosby-square, London, E.C.), stating the exhibits which they propose to send out, so that they may be informed whether similar exhibits have been already promised. With a view of making the exhibits commercially valuable to all concerned, it is hoped that exhibitors will

forward periodically the revised prices of their goods, and also send early particulars of any invention or improvement in a process relating to the goods or machinery exhibited. Such revised prices or particulars may be sent out direct, addressed to "The Commercial Museum, Tokio, Japan," and will be at once affixed to the exhibits to which they relate. Any exhibits sent will be gratefully acknowledged by the museum authorities, as they feel that each exhibit will help to make our people better acquainted with the comforts, luxuries, and general material advantages enjoyed by Western nations. This increased knowledge of the productions of other nations will lead to an extension of our requirements, and in that way, probably, enlarge or originate a market for any articles which may be kindly sent for exhibition in our museum. All packages containing exhibits or catalogues should be sent to our packers, Messrs. Perrott and Perrott, Tenter Street, London, E.C., and be marked C. M. (in a diamond). Any further information will be gladly supplied by the London office of my firm, and, in conclusion, I confidently hope that this application will meet with a liberal response, and that any exhibits sent may be at once mutually advantageous to our people and to the firms supplying them.—I am, Gentlemen, yours faithfully, T. Masuda (Managing Director of Mitsui and Co., Japan), for the Tokio Commercial College Committee.

Tokio, 15 January, 1888.

I hereby certify that Mr. Takashi Masuda is one of the committee of the Tokio Commercial College, and I hope that his application for exhibits, on behalf of the College, will be entirely successful. I also certify that Mr. George Cawley, Editor of *Industries*, is authorised to solicit exhibits on Mr. Masuda's behalf.

M. ARAKAWA, Acting Consul for Japan.

London, March 5th, 1888.

British and Foreign Consular Reports.

FRENCH TRADE WITH ITALY.—The French Consul at Leghorn, writing in the *Journal Officiel*, states that, although France was one of those countries which suffered least from the condition of Italian trade in 1886, the situation continues to be unfavourable even for her. But if French commerce is losing ground in Tuscany, the Consul considers that the fault lies mainly with the French exporters, especially as far as concerns manufactured articles. Every day, he says, the French merchant is being more and more definitely driven out of the field by foreign energy and competition, particularly those of Germany, Belgium, and Switzerland. The practice of the French houses is that they stand as the representatives of the French taste, and dare not compromise themselves by concessions to a vulgar demand. But the Consul believes that if they would prepare for the Italian market a class of goods that should be elegant in appearance and yet cheap, they would find that the Italians would prefer such articles to those offered them by less artistic firms in Germany or Belgium. The Consul condemns the want of persistence and the conventional timidity of the French manufacturers.

ENGLISH TRADE IN CHINA.—A report on the trade of Ichang for the year 1886, prepared by Mr. William Gregory, the British Consul there, has been issued as a Foreign Office paper. Mr. Gregory comments on the influences which affect British trade in that part of China, and makes some suggestions with the object of furthering our trade. He says that a great part of the decrease in imports for the year was in the important article of grey shirtings, the imports of which, in 1885, had been double the former average. Of sheetings, the American imports have decreased for several years past, while the English have considerably increased. With drills, American and English, it has been the other way, with a considerable decrease in the total of the two. White shirtings, dyed shirtings, chintzes, furnishings, &c., show an increase, which has gone on vigorously during 1887, and this may, perhaps, the report says, be quoted in support of a suggestion made that light goods, rather than heavy or coarse ones, should be our forte for the China markets. In regard to cotton goods, in May and June of 1887, there were rumours among the Chinese of bodily ailments, disorders of the skin, or even fatal disease, incurred by wearing garments of foreign cotton stuff. Such reports are capable of doing great mischief to trade, and Mr. Gregory suggests that it would be well for those who control the cotton goods trade to take means against the noxious or irritant matter in any of the articles sent out. With regard to woollens, the report states that the English camlets are far less than they were two or three years before, while the lastings are more than in any previous year except 1885. The Customs returns show an increase in iron, wire, and brass buttons, and a wish is expressed that some one from Birmingham would visit the China ports with a shipload of samples and wares for sale. Mr. Gregory remarks that he recently wrote to a house at Shanghai for weighing scales, which were sent to him from America, and that the stove in his office bears an American name. He also remarks on the cheapness of American watches in China, and ventures to suggest a trial of watches of gigantic size, say 3 in. in diam., and strongly constructed, so as to bear rough usage.

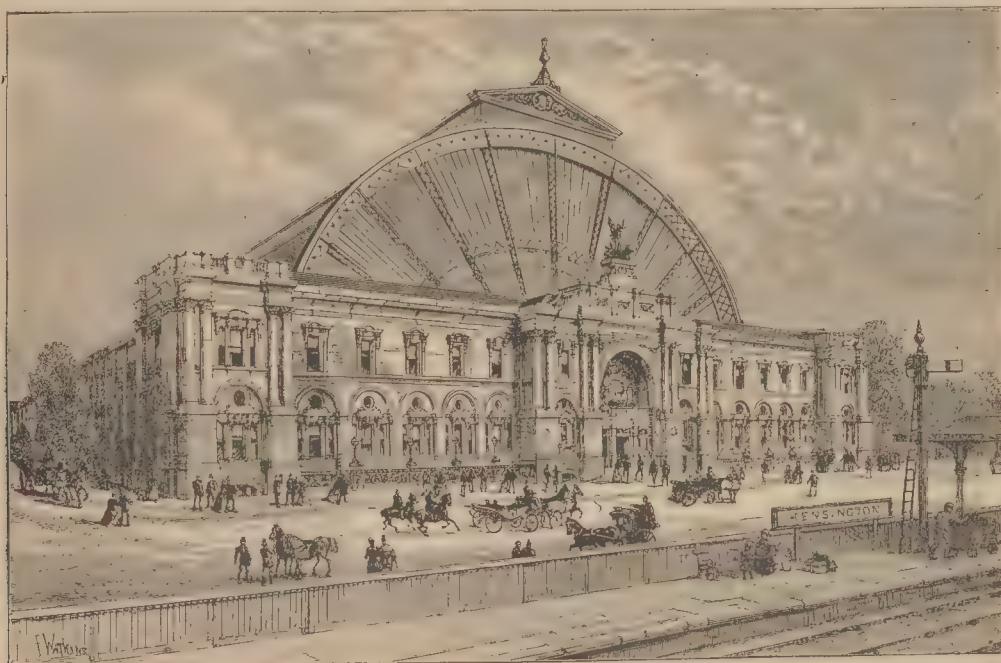
A new lubricant, the use of which is advocated in the *Austrian Railway Journal*, is mustard oil. It remains perfectly fluid at the low temperature of 14° F., and will keep unchanged for years.



In Irish Exhibition in London.

An Exhibition of Irish Industries will be held during the course of the coming summer at Olympia, Kensington, view of which is given. The Exhibition has been undertaken to place before the English public a clear view of the predominant industries of Ireland; to awaken public interest in the efforts being made to revive her trade; to exhibit to the many thousands of persons in England who have never crossed the Irish Channel somewhat of her deeply-interesting historical and antiquarian treasures; to illustrate the worth and significance of Irish art; and to help to moderate prejudices which, frequently tending to fetter the judgment, are at the very root of misunderstandings between people and people. It is believed that such an Exhibition held in London will be attended with the happiest results, and will

Sir J. Lubbock, M.P., Mr. Justin McCarthy, M.P., the Marquess of Ormonde, Mr. J. H. Raffety, Sir C. A. Russell, Q.C., M.P.; with Lord Arthur Hill as hon. secretary. Among the patrons are the Archbishop of Canterbury, the Archbishop of Dublin, and Cardinal Manning, the Marquess of Hartington, Mr. C. S. Parnell, M.P., the Lord Mayor, Sir J. Whittaker Ellis, Bart., M.P., the Duke of Argyll, the Duke of Leinster, Lord Randolph Churchill, M.P., Mr. Peter O'Brien (Solicitor-General for Ireland), Sir W. Ewart, M.P., Mr. Arthur Kavanagh, Mr. Labouchere, M.P., and Sir W. Hart Dyke, M.P. The exhibits will include in Department B, textiles and manufactures, which will embrace raw materials, yarn, woven goods of wool, cotton, silk and flax; gutta percha and waterproof articles; leather goods; hats of various kinds: clothing—embracing costumes, mantles, capes, gloves, millinery, &c.; and sewing, knitting, and weaving (by hand) machinery. Department D will contain textile machinery for manufacturing linen, cotton, and woollen goods, carpets, tapestry, lace, &c.; pumping and lifting apparatus; machines for working metal, wood, and stone; for watch-making, washing, printing, and paper making; for baking, mining, and fire extinguishing; machines for weighing, for



OLYMPIA. THE IRISH EXHIBITION.

help to increase the interest everywhere taken in the Irish Exhibition to be held in Dublin. It has been frequently urged that, if Englishmen would but go to Ireland and see that country for themselves, they would learn more from one visit than from all the speeches, books, and pamphlets, on Ireland, ever made or printed. The Irish Exhibition in London, if it effects no other purpose, will assuredly quicken the desire to know more of the country, resources, and industries of the sister Isle. A movement entirely outside the arena of politics; freed from all sectarian or class influence; initiated and undertaken with a worthy purpose; encouraged and directed by persons of energy and practical experience, there is every Assurance that the Irish Exhibition to be held at "Olympia," Kensington (the most accessible and spacious available place in London), will reach a popular success as great as that attained by similar undertakings in previous years, and command a ready sympathy and support from all parts of the Kingdom. The Executive Council includes the Dukes of Abercorn and Westminster, Lord Charles Beresford, M.P., Sir R. N. Fowler, M.P., Mr. Herbert Gladstone, M.P., Mr. Ernest Hart, the Earl of Lathom,

chemical processes, and for glass and pottery making. Department A, agriculture—includes animals, implements, farm produce, &c. Department C, ships, ship building, and machinery and accessories, as well as sea industries and inland fisheries. Department E, mining and mineral products. Department G, brewing and distillery; in addition to which there will be exhibited furniture and decoration; scientific, educational, chemical, and allied industries, apparatus; paper, printing, and bookbinding. Women's industries will occupy department L, and departments M and N will be given up to fine arts and to historical and antiquarian relics, &c., &c. In order to give the Irish artisan the same opportunity of exhibiting the product of his skill as the manufacturer, the council have determined to make no charge for the space occupied in the Exhibition except in special cases. The Exhibition will be opened on the 4th of June, and remain open until the end of October. Among the special features will be a representation of an Irish village, with peasants at work upon their cottage industries—the dyeing of yarn, making lace, knitting, &c. The profits are to be given in aid of Irish technical and commercial schools.

ORIGINAL DESIGNS.

On our first plate we give a design for Tapestry Fabric.

Our second contains a pattern for a Linen Damask Table Cover, which is also suitable for a Table Napkin. This pattern has been designed by Mr. C. W. Sandiforth, 103, Racecommon Road, Barnsley.

On our third plate is a design for Printed Muslin for Curtains and other purposes.

Dr. Clayton's Fabric Tables and Apparatus for Calculating the Weights, &c., of Textile Fabrics and Yarns.

In our last issue, we gave a paragraph descriptive of the above. Since this appeared, we have sold a quantity to our numerous subscribers, and have found that they give the greatest satisfaction. Those of our readers who have not yet purchased should do so, as the tables and apparatus are of the utmost practical value to manufacturers. Orders may be sent to us with the price, 10/6, enclosed; for United States and Canada, 3 dollars.

MONTHLY TRADE REPORTS.

Wool.—At the London Sales, which opened on the 5th instant, there was a good attendance of buyers, and bidding for good lots was of a spirited character, prices averaging those at the close of last sales. In the Scotch districts, trade in wool has been rather dragging, prices showing a slight downward tendency. In the Yorkshire districts, business, early in the month, was very quiet, but this gave way to a gradually improved feeling, until at the close of the month, dealers did a fair amount of trade at improved prices. In the yarn branch, there is nothing of any note to report, business generally being of a hand to mouth character, whilst orders are small in bulk, and mostly offered at low rates, still there is, on the whole, a hopeful feeling, as many inquiries have been made. The piece trade has only been quiet, the home trade being perhaps a little better, but orders have been mostly for small quantities. There has been a fair demand for coatings for America, this branch being the most satisfactory part of the worsted trade.

Woollen.—Much disappointment has been felt by manufacturers in the various branches of the woollen industry that their anticipations at the commencement of the year of a good trade have not been fulfilled. With the exception of those engaged in the production of cloths for the clothing trade, stocks are beginning to accumulate at an unsatisfactory rate. The severe weather of the past few weeks has been much against manufacturers, and the prospects for the immediate future are not bright. The producers of ready made clothing have been extremely busy recently, and, in consequence, the lower class of cloths has moved off freely, and stocks in the hands of manufacturers are light. Worsteds of all descriptions, have been rather slow of sale, the finer kinds being in the best demand, whilst low qualities have sold only moderately. The tweed branches have been quieter, and the prospect is not cheering.

Cotton.—During the past month, there has been a cheerful feeling pervading the markets, both for yarns and cloth. Spinners and manufacturers generally are well engaged for the next few weeks, and orders taken have usually been at hardening rates, as they have preferred not to accept any new engagements unless at an advance in prices. The demand for yarns for export has ruled about the average, and numerous inquiries have been made for the East, fairly good orders having been booked. The home trade has also been pretty

satisfactory. For cloth, the export branch has been active, large orders for shirtings, jacconets and dhooties having been given for India and China, whilst, for the home markets, with a few exceptions, much new business has been done at firm rates.

Linen.—There is little new to report in this trade, the production of most classes of goods is ahead of the consumption, and prices have, in consequence, been weak. The best business has been done in fine fancy drills, which have sold fairly well. Fancy damasks have been in moderate request, but at low rates, and cloths of the domestic kinds, as tea, crumb, kitchen, and pantry fabrics, have been rather quiet. Attention has been devoted more to fancy coloured towellings, window blinds, &c., and these have sold fairly well. Flax and jute have been quieter, the rates offered being rather lower, but, generally, producers have not made any concessions.

Lace.—There has been a slight improvement in some branches during the month, but, as stocks in hand have been large, any extra demand has not sensibly affected producers. In curtains, a fair sale has been experienced, but, production being ahead of the demand, prices are kept down to an unsatisfactory point. The same may be said, with regard to prices, of the various descriptions of lace about which there is no novelty. Anything absolutely new is taken up eagerly at remunerative rates, but, unfortunately, novelties are few. The cold weather has been much against trade, and this, coupled with the competition from abroad, tends to render manufacturers somewhat despondent.

Goats' Hair in Woollen Goods.

A recent issue of *Les Tissus* states that:—Everyone knows that for a long time, and under different conditions, advantage has been taken of goats' hair, mixed with wool, to adorn the stuffs. There is some goats' hair of exceeding fineness, and of an unalterable brilliancy when dyed. This material, of which the best specimens come from the Angora goats, is employed in different industries, especially by lacemen. In the drapery it is especially employed as long hairs of lively shades in the "rough" and "cloth" finished stuffs. Although very solid, in spite of its fineness, the goats' hair has not been employed alone in cloth manufacture, because its softness was not sufficient for the stuffs required, the suppleness of which is the principal quality. However, marvellous results are obtained, and we are glad to tell our readers that we have obtained information which we are persuaded will not be without interest for them. Formerly, the goats' hair was left its full length even in the stuffs, but now, it is reduced until comparatively short, then it is regularly mixed with the worsted in order to obtain fine threads—from 11,000 to 14,000 yards per pound in twisted worsted, for instance, and double the length in single ply. The mixture and twisting are made in the natural state of the materials, as regards the wool and the goats' hair. The latter is employed in the proportion of five and ten per cent. According to the required designs, the mixed threads are combined with threads of pure wool in woof, and in warp, for the matched tissues. The dyeing is only done after the weaving. The two materials not taking the same proportion of dye, there is, of course, a difference of tint caused by the silky brilliancy of the goats' hair in opposition to the dulness of the wool. It has not quite the effectiveness of silk, of which it reminds us in different ways, but still it is quite as charming, fine and pretty, with a particular elegance, and superior to the other by its novelty. The harmony of the tints proceeding from the same colour is really charming. It is more especially when a ray of light comes over it that it is extremely brilliant and very rich. The stuffs dyed in pieces can only be employed for overcoats or jackets. Let us say that they might be done in any tint, even the lightest.

A Presidential decree has authorised the organisation at Buenos Ayres (Argentine Republic), of a permanent exhibition of natural products, and the industries of the country. The exhibition will comprise, in a scientific and industrial classification, the raw materials found in the Republic, with the designation of their place of origin, their extent, and other information taken from reliable sources—the most recent calculations and documents. Detailed industrial information will also be collected, as well as samples of the products of existing industries.



London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1875.



Philadelphia, 1876.



Dublin, 1885.



Leeds, 1875.



HEATS THE FEED WATER WITH THE WASTE HEAT TO A TEMPERATURE
CONSIDERABLY ABOVE BOILING.

CONTRIBUTES GREATLY TO THE DURABILITY OF BOILERS.

Can be applied without stoppage of works. Has been in operation to
every description of Boiler for upwards of 35 years.

IMPROVEMENTS have just been MADE in the CONSTRUCTION and DETAILS of the MACHINE.

The Pipes are cast VERTICALLY and in DRY SAND MOULDS.

THESE ECONOMISERS ARE NOW CONSTRUCTED FOR EXTREME HIGH PRESSURES.
PROVISION MADE AGAINST INCRUSTATION AND MUDDY WATER.

1887. New Patents. 1887.

No fewer than SIXTEEN PRIZE MEDALS have been gained by the
Economiser, the highest award being obtained in every case for sound workmanship
and superiority of design.

Original Inventors, Patentees, and Sole Makers,

EDWARD GREEN & SON,

ST. ANN'S SQUARE, MANCHESTER.

WORKS:--WAKEFIELD, YORKSHIRE.

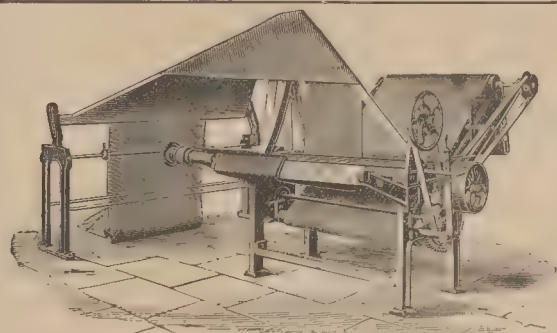
J. H. RILEY & CO., BURY, near Manchester.

Specialities.

**RILEY'S PATENT FULL WIDTH
BURR EXTRACTING OR CARBONIZING MACHINE**
for Dyed and Undyed Woollen Goods.

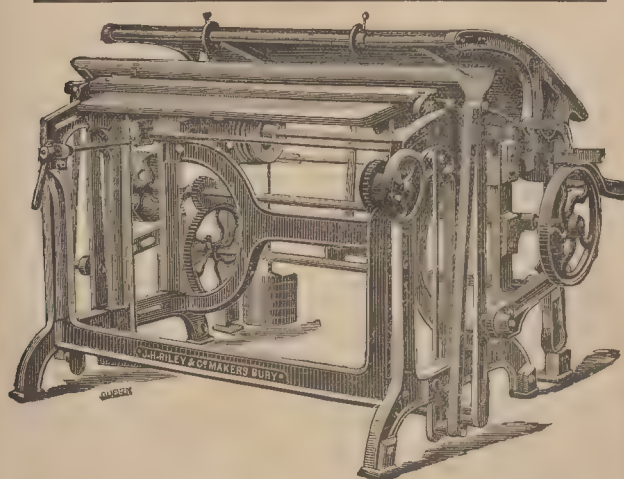
WET FINISHING MACHINE
for Bradford Dress Goods.

CALENDERS for Satteens, Italians, and every class of Textile Fabrics.



ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing
Depôt, Pimlico, and to the Indian Government. References to a
large number of machines at work.



RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.
We have some scores of these machines at work.

**J. H. RILEY & CO.,
BURY, NEAR MANCHESTER.**

JOHN DOWNHAM & CO., ENGINEERS, MILLWRIGHTS AND MACHINISTS, BURY, near Manchester.

ELDER'S RIGGING MACHINES

WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

IMPROVED CUTTLING MACHINES

For Folding Single and Double Woollens and Worsteds.

STEAM DRYING MACHINES

WITH TIN AND COPPER CYLINDERS,
For Dyers, Bleachers, Finishers, Warp Sizers, &c.

Calenders, Beetles, Dye Becks, Dye Jigs, &c.

Prices and Drawings on application.

DELIVERED AND ERECTED READY FOR WORK.

J. H. PICKUP & CO.,

(Successors to JAMES ANKERS),

Tin-plate Workers, Coppersmiths, &c.,

BRITANNIA WORKS, BURY, near MANCHESTER,
MAKERS OF EVERY DESCRIPTION OF

Tin, Iron, Zinc, Brass, and Copper Goods,

For Machinists, Cotton, Woollen and other Mills.

**Tin Rollers for Ring Frames, Mules, Throstles,
Winding and Warping Frames.**

We have made a speciality in Tin Rollers, knowing the importance of
Machinists and Mill Owners having a **good and true** Roller to run
the **speeds** that are now required. Our Rollers are made from the
best sheets, and put together by very efficient workmen.

LARGE STEAM DRYING CYLINDERS,

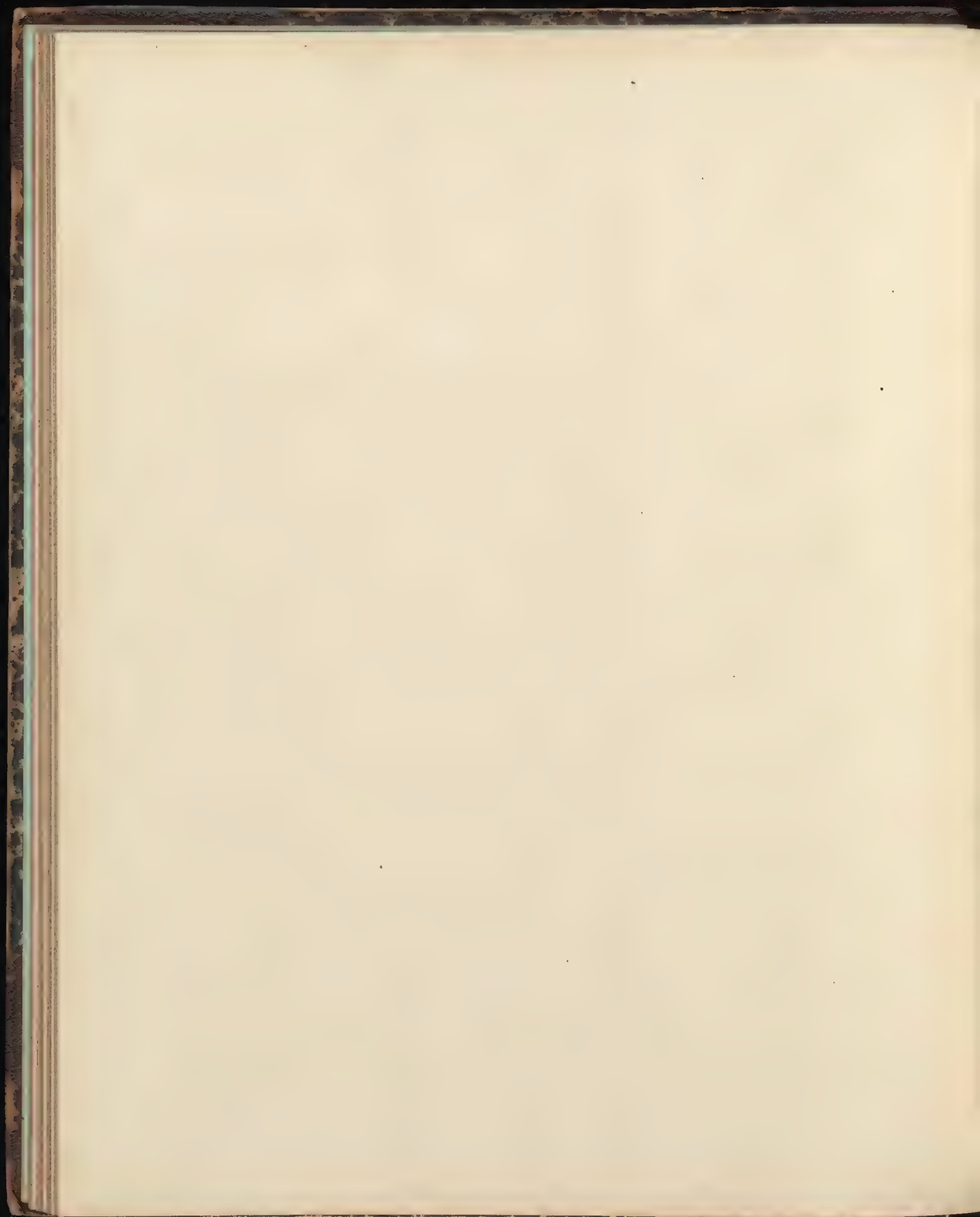
Any diameter up to 12-feet, and any length, either in Tin or Copper.

SINGLE-CASED OR CAVITY CYLINDERS

MADE ON THE MOST APPROVED PRINCIPLE.

Estimates on application. Repairs promptly attended to.





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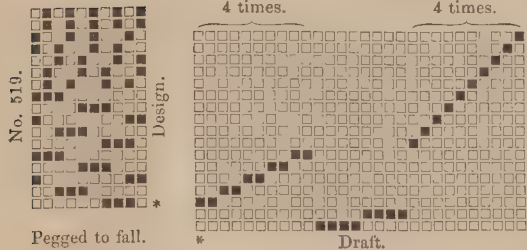
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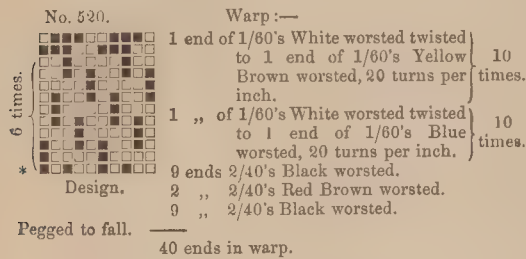
FASHIONABLE DESIGNS.

Worsted Trouserings.



Warp:—2/56's Indigo worsted. Weft:—2/56's Indigo worsted.

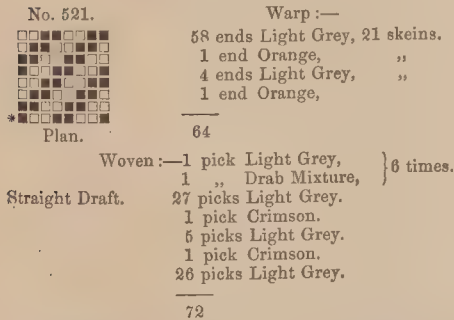
7,128 ends in warp; 114 ends per inch; 19's slay; 6 ends in a reed; 100 picks per inch; 62½ inches wide in the loom; 54 inches wide when finished. Clear finish. Weight 15½ ozs. per yard.



Weft:—60 picks of 2/40's Black worsted.
2 „ 2/40's Red Brown worsted.

5,400 ends in the warp; 90 ends per inch; 22½ slay; 4 ends in a reed; 62 picks per inch; 60 inches wide in the loom; 54 inches wide when finished. Clear finish. Weight 13½ ozs. per yard.

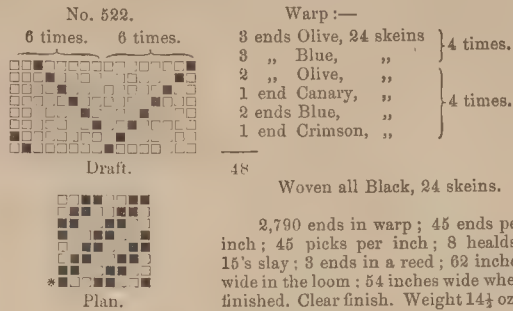
Woolen Mantle Cloth.



Woven:—1 pick Light Grey, 1 „ Drab Mixture, 27 picks Light Grey, 1 pick Crimson, 5 picks Light Grey, 1 pick Crimson, 26 picks Light Grey.

3,024 ends in warp; 48 ends per inch; 46 picks per inch; 8 heads; 12's slay; 4 ends in a reed; 63 inches wide in the loom; 54 inches wide when finished. Weight 19 ozs.

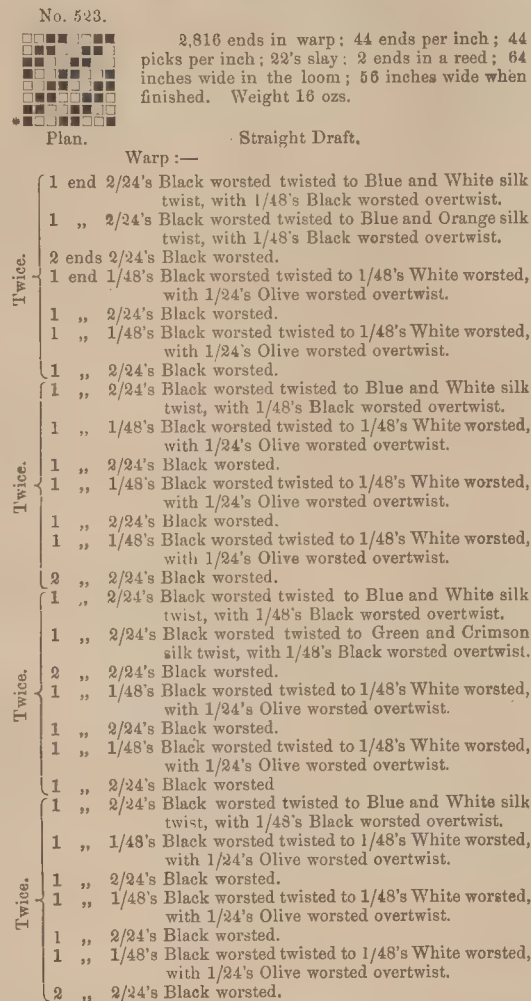
Woolen Trousering.



Woven all Black, 24 skeins.

2,790 ends in warp; 45 ends per inch; 45 picks per inch; 8 heads; 15's slay; 3 ends in a reed; 62 inches wide in the loom; 54 inches wide when finished. Clear finish. Weight 14½ ozs.

Worsted Mantle Cloth.



Warp:—

- 1 end 2/24's Black worsted twisted to Blue and White silk twist, with 1/48's Black worsted overtwist.
- 1 „ 2/24's Black worsted twisted to Blue and Orange silk twist, with 1/48's Black worsted overtwist.
- 2 ends 2/24's Black worsted.
- 1 end 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 2/24's Black worsted twisted to Blue and White silk twist, with 1/48's Black worsted overtwist.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 2/24's Black worsted twisted to Blue and White silk twist, with 1/48's Black worsted overtwist.
- 1 „ 2/24's Black worsted twisted to Green and Crimson silk twist, with 1/48's Black worsted overtwist.
- 2 „ 2/24's Black worsted.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 1 „ 2/24's Black worsted.
- 1 „ 1/48's Black worsted twisted to 1/48's White worsted, with 1/24's Olive worsted overtwist.
- 2 „ 2/24's Black worsted.

Woven as warped, with the exception of Fancy Black, Blue, and White, which in weft must be Black, White, and Orange.

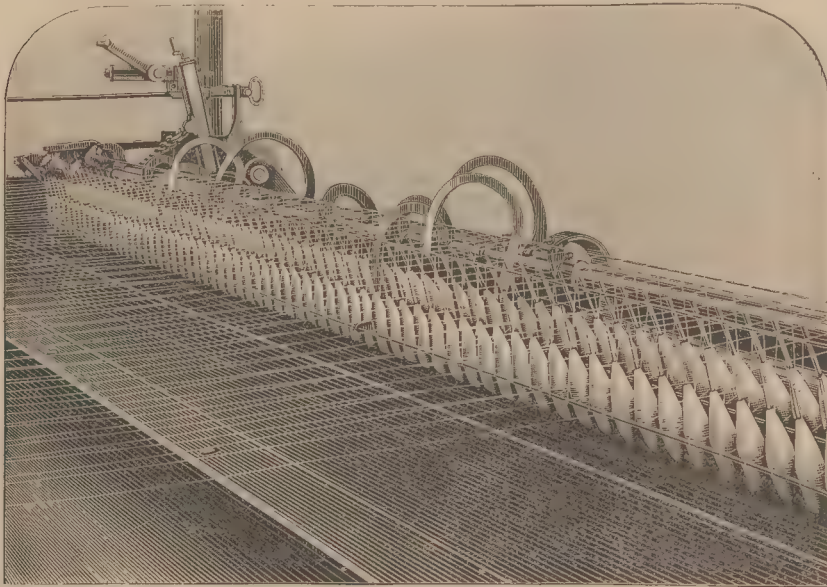
MACHINERY, &C.

The New Patent Compound Mule.

In our last issue, a description of Ashworth's patent compound mule was given, but owing to the absence of illustrations, many of our readers were unable to grasp the various improvements pointed out, we therefore give two cuts of the mule, taken from machinery on view at Mr. R. Threlfall's works at Bolton. Mr. Ashworth is doing his utmost to put it



before users of mules, and is giving every facility for such to have a thorough inspection, and to judge of its capabilities. To intending visitors to the forthcoming exhibition at Brussels, which opens early in May, an opportunity will be afforded of inspecting it thoroughly, as space has been taken, and arrangements made, for placing in the mule. The leading feature of the machine is its double row of spindles; of course, it is well known that the idea itself is not new, but practically it has hitherto been a failure, owing to its inability to compete with mules as generally in use at the present time, but Mr. T. Ashworth,



the patentee, has carried out his ideas in such a form that the mechanism in practice is guaranteed to do more work than the present mules, and with a less expenditure of power and labour generally, whilst, at the same time, a considerable space is economised in the fixing of the machines. Mr. Ashworth writes:—"Taking into consideration the length of carriage, and the weight and quality of yarn produced, this mule is, undoubtedly, the best and fastest in the world for spinning all kinds of twist yarns. This is my claim, in spite of all prejudice, and I await the result with every confidence." The mule at present in work has been designed

for the Bolton trade, but the inventor states that it can be equally adapted to the spinning of other yarns. In the worsted and woollen districts, it ought to meet with much favour, especially amongst those who spin the finer counts of yarns, such as botany and fine English, as a greatly improved yarn is produced on the mule, and at the same time a larger percentage is put upon the cop or spindle. There is an ordinary weft creel, with inch space rollers, double roving to each end, and single boss rollers $\frac{3}{4}$ in. traverse. Fig. 2 gives a view of the double row of spindles. Although the mule at present at work is designed for Bolton counts only up to 60's, of course, it will do equally well for Oldham counts where a less creel is required. The spindles are very strong— $17\frac{1}{2}$ inches long, 9 inches out of the bolster, with 1 inch wharves, space 2 inches, difference in heights of spindle points $1\frac{1}{2}$ inches, to allow fallers to work independently of each other. The extra row of spindles, or the row the furthest from the rollers, is placed $\frac{1}{2}$ inch out of centre to the left, to prevent the ends, when breaking when the mule carriage is out, from flying on to the yarn of the front row of spindles. The bevels are suitable to the topping of each row of spindles. The speed of the tin roller is 1,200 revolutions per minute, and the spindles 7,500 revolutions per minute, which is a nice speed for 60's twist. The coping fallers are connected by levers on each side of the headstock, the rods which originally crossed the headstock being done away with. The levers on the coping fallers are connected by adjustable right and left screws with lock nuts, though these are not really necessary, and may never be used in 10 years' working, still they are there if required. The under fallers are loose, and are released by suitable levers. The mule as at present working is beating the ordinary $1\frac{1}{2}$ in. space mule, which is working on the other side of the headstock, by 37 per cent., and makes cops 8 in. long and $1\frac{1}{2}$ in. diam. worth 5 per cent. more money than ordinary cops. The mule carriage is fitted with a skeleton spindle box, open underneath to allow of the spindle bands being put on the front row of spindles, without having to be tied on the tin roller. To oil the front top bolsters, there is an automatic oil can operated by clockwork and about 8 in. long, which travels on a rail, fitted on the inside of the mule carriage, at a uniform speed, oiling continuously or otherwise at will. The clockwork, can be arranged to travel the oil can at any desired speed. The wharves on the extra row of spindles are about 4 in. further from the tin roller than the ordinary row, which makes no alteration or variation in the speed of the spindles. According to indications, both rows of spindles make the same number of revolutions per minute, and the variations in counts and strength from various testings prove without doubt that the cops all through vary no more than the cops on the old-fashioned mule, and it is guaranteed that all cops will be alike if the hobbins are alike, but this is talking of the impossible. The inventor claims that he has kept to the old principle of spinning, as invented by Samuel Crompton 100 years ago, and, besides the principle being a correct one, he claims that for the counts for which the mule is designed, as it is at present running, and from its results and working, it is, and must be, after being rebuilt four times in 43 months, mechanically perfect. For fine counts, say 200's, the usual alterations of heights, bevels, &c., will have to be made, but what the ordinary spindle can spin, the inventor maintains that the extra row of spindles can be made to spin also. If the bevels can be adjusted for 60's, they can be adjusted also for 200's, as the heights and bevels are mere nothings, $\frac{1}{2}$ in. bevel either way will make no difference, the under-fallers equalising both. We should advise spinners in the worsted districts to see the mule working, and then they will be able to judge of its merits.

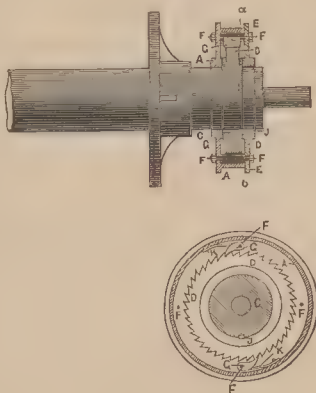
Combined Sizing, Drying and Warping Machines.

In the operation of combined sizing, drying and warping machines, as the textile threads are coiled one on the top of the other in the warping mill, more thread is wrapped on at each succeeding revolution, in consequence of the increase in the diameter or size thereof, but, as the rollers of the sizing and drying machine, between which the threads pass to the warping mill, only revolve at one and the same unvarying speed, the tension of the stretched threads constantly varies and increases as the difference in speed between the circumference of the mill, and of the letting-off rollers on the drying machine increases, with the frequent result of breakage of the thread, and unevenness of tension with which it is wrapped on to the mill. Mr. E. Brook, Rescliffe Ironworks, Huddersfield, and Mr. J. Vickerman, Mirfield, have made improvements recently in this class of machinery. Their object being the providing of means or apparatus for automatically regulating the tension of the threads, when being operated upon in such combined machines, so as to lessen the risk of the breakage of the threads, and to increase the regularity of the coils upon the warping mill. The object is attained by the application and use of a loosely mounted rising and falling roller, the movements of which are guided by a

suitable framework, and are dependent upon the tension of the threads, which are caused to pass under, and to support, the roller, causing the same to rise or fall according as the tension or pull upon the threads increases or decreases. The spindle of the roller is suitably connected to a lever arm, projecting from a rocking shaft, working in bearings or supports, fixed as may be convenient. From another part of the rocking shaft, another lever arm projects, its upper end being linked, or otherwise suitably connected to a sliding block or belt-shipper, working on a guide, which may be supported in any convenient manner. The belt, or driving band, upon which the sliding block or belt-shipper operates, passes partly round a pair of slightly conical pulleys oppositely arranged, the small end of the one being arranged opposite the large end of the other, so that, as the belt is shifted from the large end of the driving pulley towards the large end of the driven pulley, by reason of the operation, through the means described, of an increased pull or tension of the threads on the lifting and lowering roller, the warping mill is thus caused to run somewhat slower in consequence of deriving its motion by a train of wheels operated from the driven conical pulley. When one section has been wound on the warping mill, and another section is commenced, the tension on the threads is the least, as the mill may not at first take on the threads as fast as they are let off the sizing and drying machine, this is immediately rectified by reason of the loose roller falling by gravity in its frame, and thus keeping up the requisite, or desired, tension on the threads, which it continues to do until the roller, in its descent, has dragged the belt-shipper and belt towards the large end of the driving pulley, so as to cause the warping mill to take up the threads at the same speed as they are leaving the drying machine, and, as the coil on the mill gradually increases, the belt is again correspondingly shifted in the manner described. The mere rising and falling of the loose roller, is of itself sufficient to regulate the tension by letting off, or taking up, the threads, according as the mill and drying machine are running faster or slower than each other, but for great differences of speed, and to obviate any danger of the lifting roller dragging the ends of the threads back through the slay, when each section is cut off, the conical pulleys are preferably provided. The roller may be weighted so as to give any desired tension upon the threads in accordance with the nature thereof.

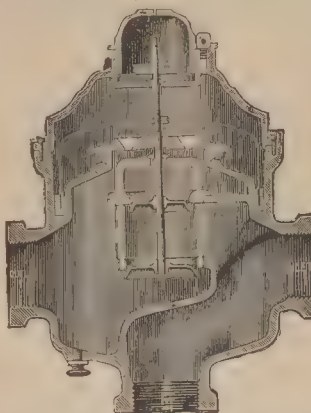
Woodhouse and Grimshaw's Improvements Connected with Let-Off Motions for Looms.

Let-off motions for looms of various kinds have been the subject of numerous patents during the present generation, and as time goes on, this description of mechanism is gradually improved, and the various inventions having more or less merit to recommend them. One of the latest improvements has been patented by Messrs. E. Woodhouse and John J. Grimshaw of Farsley, near Leeds, who have practically worked out certain points that will render their motion of advantage to users of looms generally. The leading object has been to provide an efficient mode of reversing, or turning back, the warp beam, without in any way disarranging the letting-off motion, or such like mechanism, for regulating the tension of the warp. The invention can be applied to a warp beam, fitted with common cord and weight tension mechanism, and also, with equal facility, to various other letting-off motions. The improvements are carried out by connecting the drums, or metallic caps, on the ends of the beam, round which the weighted cords are wound, to the beam, by pawl or ratchet connections, in such a manner that the beam is free to be turned back without actuating such drums. A general idea of the mechanism and its advantages may be gathered from the illustrations. Fig. 1 represents an elevation of a warp beam with the improvements applied thereto, the drum being shown in section. Fig. 2 is a cross section through the broken line *a, b* in Fig. 1. The drum A, upon which the cord B of the let-off motion is wrapped, is loosely mounted upon the end of the beam C over the ratchet wheel D, which is rigidly fixed by the key J to the end of such beam. The plate E, forming one side of the drum A, is made separate to allow the said drum to be placed over the ratchet wheel D, and the plate is afterwards secured to the drum by the bolts F. Two pawls G are mounted on two of the bolts F inside the drum A, and the springs K keep them engaged with the ratchet wheel D, which prevents the beam C being rotated in one direction without the drum A, but such beam may be turned in the opposite direction, to wind up the warp, without rotating the drum A, thus interference with the let-off motion is avoided. Further particulars of the invention may be had from Mr. E. Woodhouse, Farsley, Leeds.



The "Shaw" Patent Gas Governor.

It has been an established fact for some years past that a regulator or governor in connection with a gas meter is a necessity wherever gas is used, either on a large or small scale. The large consumer generally admits that there is a saving in their use, and the question they ask themselves is "Which is the most efficient mechanism for the purpose of regulating the pressure of gas?" There have been numerous "governors" put before the public, but, with few exceptions, they have proved to have had many disadvantages, which, in the long run, have counterbalanced any advantages they may have possessed. Others have proved to be exceedingly advantageous and have been the means of considerably lessening the previously large gas bills. The "Shaw" Governor now being made by Mr. Joseph Shaw, of Lockwood, Huddersfield, is the result of much experience, thought, and of many experiments. The mechanism, which is already acknowledged by practical judges to have all the advantages claimed for it by the inventor, is almost perfect. By its use a saving of from 10 to 40 per cent. in the consumption of gas is guaranteed. This latter fact is vouched for by those who already have the governors in use. Mr. Shaw informs us that a "governor" costing £5 was fixed at the "Leicester," Leicester Square, London, and in the five months, April to August, 1886, a saving of 135,600 ft. was effected, representing a sum of £20 10s. The "Shaw" is constructed of the most durable materials, with a substantial outside iron casting, while the interior, or working parts, is made of gun metal, having an equilibrium or double beat valve, enclosed in a cage or jacket, which is screwed into the



centre of the governor. The cage is covered with a metal cap which also supports and guides the spindle, and above the metal cap, and secured in the centre to the valve spindle, is a float or inverted cup floating in quick-silver; when the valves and working parts require cleaning or repairing, the dome is removed, the metal cap and cage are unscrewed from the governor, so that they can be cleaned or repaired and placed back again without disconnecting the governor from the service pipes, and without interfering with the proper and efficient working of the valves and parts, which is a great advantage, as this can be done in a few minutes by any ordinary workman. When once the "Shaw" is fixed, it requires no attention whatever, but, with the utmost regularity, automatically performs its duty of checking waste, thus silently saving the owner's pocket from needless and unprofitable expenditure.

Dyeing Cotton and other Fibrous Substances in Aniline Black.

This invention, by Mr. J. Grunhut, of South Shields, relates to improvements in the process and means of dyeing, in aniline black, cotton, jute, and other vegetable fibres or fibrous substances in the raw, spun, or woven state. In carrying out the invention, the mordanting of materials is effected by placing the same in a vessel containing, for each 100 lbs. of the materials about 500 gallons of water, and half-a-pound of congo red, or of benzo purpurine, or of blue azurine, or of chrysamine, or of paraphenylen blue, or of delta purpurine, or of hessian red, or of benzo purple, or of azo blue, or of congo corinth, or of hessian violet, or of hessian purple, or by placing the materials in a vessel containing a similar aqueous solution of half-a-pound each of congo red and of blue azurine, and with about 10 lbs. of soda crystals, or with 5 lbs. of carbonate of soda, or with about 10 lbs. of carbonate of potash, or by placing the materials in a vessel containing an aqueous solution of a mixture of any of the above colouring matters, and in each case boiling the materials in the solution used for about half-an-hour, or long enough for them to be sufficiently mordanted. After they have been thus treated, they are washed, and are subsequently dyed in aniline black in the following manner:—the materials are firstly placed in a suitable vessel containing for each 100 lbs. about 200 gallons of water, 8 lbs. of aniline oil, 8 lbs. of bichromate of potash, and about 32 lbs. of hydrochloric acid, and are worked about in the solution, which may be either cold or warm, for an hour and a half, or sufficiently long to be thoroughly impregnated, and are then removed and washed. They are next placed in a vessel containing for each 100 lbs. of the materials, about 200 gallons of water and 8 pints of sulphuric acid, or a relatively equivalent quantity of any mineral or vegetable acid, and are left in the solution, which may be either cold or warm, for about half-an-hour, or sufficiently long to be thoroughly impregnated with the solution, and are then removed and washed. Or, in lieu of the said materials being treated according to the process described, they are boiled in a solution of soap or soda, or of soap and soda for sufficiently long to be thoroughly impregnated with the solution, and are then removed and washed, and are subsequently boiled in solutions of

any of the above-named colouring matters belonging to the azo group. The materials are, after being treated to either of the alternative processes described, placed in a vessel containing, for each 100 lbs. of the materials, about 200 gallons of water, 10 lbs. of carbonate of soda or other alkali, or of carbonate of potash or neutral alkali, or of phosphate of sodium, and about 1 lb. of hessian blue or of other specified azo colouring matters, such solution being prepared by boiling the water and adding the salt and colouring matter, the materials being placed in such solution and boiled for about half an-hour.

Methylene Blue for Printing on Textile Fibres.

The firm of Farbwerke vormals Meister Lucius and Brüning, of Höchst-am-Main, Germany, have patented in this country a methylene blue specially adapted for printing on textile fibres. The methylene blue generally employed contains the colouring matter in the form of a chlorzinc-bicomponent. The chlorzinc, contained in the colouring matter, has the effect that when textile fabrics, printed with the ordinary methylene blue of commerce, are being steamed somewhat intensively, the fibres become short, and the colouring matter itself is partly destroyed. In order to avoid this defect in the ordinary methylene blue, there is, according to the present invention, prepared from the same a colouring matter which does not contain any chlorzinc, and which gives much better technical results. Moreover, this product dissolves far more easily, a fact of great importance in the art of printing. According to this invention, the zinc is precipitated from the solution of the ordinary methylene blue of commerce by means of suitable precipitating agents, such as alkalies, carbonates of alkalies, or similar basic compounds, or sulphides, or by means of oxalates or phosphates of alkalies, and by the addition of common salt (or by recrystallization) the dissolved colouring matter is separated from the filtrate. Example:—100 parts of the methylene-blue-chlorzinc-double-salt are dissolved in about 1000 parts of boiling water, and to this solution are added 14 parts of calcined soda. From the liquid which is filtered hot from off the precipitate, the colouring matter will crystallize on cooling down.

The Making Up of Bundle Yarns and Piece Goods.

Last month, the Association of Extra Hard Spinners stated a case for the opinion of Mr. Henn Collins, Q.C., as to the operation of the Merchandise Marks Act, 1887, in reference to the making up of bundle yarns; the case and opinion were afterwards published in the Manchester papers, and a cutting containing them accompanied this case. The opinion has given rise to much controversy, and the uncertainty of the law is a serious injury to trade. A committee has been formed to consider the matter, and a statement explaining more fully the method of making up yarns was made to the Committee by the Extra Hard Spinners on the 22nd inst. A print of that statement also accompanies this case. The most important part of Mr. Henn Collins's opinion is that which advises that a person, who so makes up a parcel of yarn as to cause it to appear, to ordinary persons familiar with the trade, to contain a number of hanks different from what it does contain, and, therefore, a yarn of different fineness, commits an offence under the Act, although he puts no label, stamp, or mark upon the cover or upon the yarn, and even though he puts an honest description on the cover, as in alternative five of the case stated to Mr. Collins. It is this part of the opinion that is material to the present case. If the opinion is in this respect sound, it is obvious that the principle involved will affect other portions of the cotton trade, and probably many other trades also; in particular it affects traders in, and bleachers of, cotton piece goods. In many classes of exported cotton piece goods, it is stated to be the custom to check the length of the goods by counting the number of folds, or laps, in piece, and that, in markets where the yard is a recognised standard of measurement, such goods are customarily folded by the yard, so that the number of folds of each piece may correspond with the number of yards. The length of piece goods is generally stamped upon their face—thus a 40 yards piece would be marked "40 yards," or "40 yds.," or merely 40 (within a diamond) without the word "yards." A practice has also existed of folding pieces which measured less than 40 yards so as to show 40 folds, or laps, and such goods were sometimes marked "40 fids." or "40 laps," or merely 40 (in a diamond). It is stated that ordinary purchasers in a foreign market would not understand any difference between "40 fids." or "40 laps," and "40 yds." and that they would believe that goods which were marked "40 fids." "40 laps," or 40 (in a diamond), and showed 40 folds, or laps, were 40 yards long. Assuming this to be the fact (and it is hardly disputed) it is clearly an offence under the Act to mark

goods which measure less than 40 yards "40 fids.," or 40, (in a diamond), and it is agreed that such marking must be discontinued. But Mr. Henn Collins's opinion raises this further and very important question, viz.:—Assuming that the existence of 40 folds or laps would, in the absence of any length marked, lead ordinary persons familiar with the trade to believe that the goods were 40 yards long, does a person who folds goods which measure less than 40 yards (say 38 yards), so as to show 40 folds or laps, commit an offence against the Act, although he puts no length mark at all upon them? This question especially affects bleachers. All white cotton goods are made up and stamped by the bleacher, who acts upon the instructions of the merchant, who has himself no interest in the sale of the goods. Bleachers are now frequently requested to make up goods measuring only 38 or 39 yards so as to show 40 folds, and to put no mark on them; most bleachers now decline to do this, and some find that the goods are consequently sent to another bleacher; other proposals similar in principle are also made to bleachers, e.g., to make the goods up in this way and put on them "Thirty-eight yards" in words (which are probably unintelligible to Indian and Chinese purchasers) instead of the usual figure mark, or to put "38" inside the first lap (where length is sometimes marked) instead of on the face of the goods; if one bleacher declines the proposal another probably adopts it, and gets the custom. Such a state of things is eminently unsatisfactory. Many bleachers are afraid to carry out such instructions themselves, and yet entertain very great doubt whether the Act was intended to apply to mere making up of goods, or whether it is desirable that the law should have such extensive application; they hesitate, therefore, to institute a prosecution, even to test the question; moreover, they feel that the decision of a magistrate or a court of quarter sessions would have no real weight. Their difficulties are increased by the fact that they have little or no personal acquaintance with the custom of foreign markets, and cannot themselves say what would, or what would not, deceive foreign purchasers, or what would, or what would not, be sufficient to obviate their deception. It must be born in mind that bleachers cannot simply refuse to do anything as to which they entertain a doubt—half their custom would at once go to others who had fewer doubts or were more reckless,—and they have no right to assume that their customers intend to practice deception.

Indophenols.

These colours give blues and violets of remarkable cheapness and fastness. They are employed exclusively on cotton. Commercial indophenol contains as an impurity a small quantity of a violet colouring matter, which can be removed by washing the paste with dilute sulphuric acid, but this is not usually, if ever, necessary. The colour is insoluble in water, but, when reduced, it becomes somewhat soluble in water in the form of indophenol white. If then placed upon the fibre, it is oxidized as in ordinary indigo dyeing, if in alkaline solution. Dyeing with indophenol is very simple, and closely resembles indigo dyeing. The indophenol is first reduced in an alkaline bath by means of glucose, at a temperature of about 175° F. The liquid becomes greenish, with a bronze film on the surface, and resembles an indigo vat. The bath is next diluted with cold water and the cotton immersed. When the desired shade is reached, as shown by swatches, the cotton is raised, squeezed, washed, and the colour is developed by oxidation by means of prolonged exposure to the air or by an oxidizing bath. The cotton comes out of the bath with a greenish-gray colour, which oxidation changes to an indigo-blue. The usual oxidizing agents, as bichromate of potash, can be used, but Koechlin and Witt recommend an ammoniacal solution of a copper salt (sulphate, nitrate or chloride), through which air is blown by an inspirator. Such an oxidizing bath can be used indefinitely. Another, and apparently preferable, method of reducing the indophenol is by tin salts. Thirteen pounds of tin salts are dissolved in six gallons of water, and thirteen pounds of carbonate of potash in six gallons of water. The two solutions are mixed and the oxide of tin filtered off. Nitro-muriate of tin is then neutralised with this oxide, and the indophenol, wet with acetic acid, added. This reduced solution is diluted with water, and the goods are prepared with alizarine assistant passed through. After thoroughly

working, the cotton is washed and the colour is developed with a bichromate bath, containing one pound to the one-hundred of cotton, at 120° F. Blues coloured with indophenol resist both soap and light well, even direct sunlight and also fulling.—*Moniteur Scientifique.*

Nickel Mordants.

Although the use of nickel is destined to find a place very slowly, if at all, in the dye-house and printery, yet the effect of nickel salts on certain individual colours may well be noted. *Alizarine*—Nickel yields a reddish-violet lake with alizarine. The nickel is best fixed on the fibre with oil in the ordinary way. It is dyed and steamed without pressure for forty-five minutes, and then given boiling soap. The red is fiery, but a little more blue than with alumina. Lime salts are disadvantageous. *Alizarine orange*—gives, when treated as above, a brownish or orange-red. No pressure can be employed in steaming. The shades are not so fast as those obtained with alizarine. *Alizarine blue*—This colour gives brilliant results with nickel salts. The blues are pure and very beautiful. They should be entered cold, at the end of fifteen minutes raised, in forty-five minutes, to 105° F., and finally, in thirty minutes, to boiling. The shade is then bluish-green, but becomes pure blue upon soaping. The shades are very fast. *Ceruleine*—gives with nickel yellowish greens than can be obtained with alumina or iron. The process is the same as for alizarine blue. *Gallozanine*—gives, with nickel salts, blue-violets of remarkable fastness. *Galleine*—gives very fast blue-violets. *Persian berries*—give yellows resembling those produced by chrome, but much faster. *Red wood*—The colours are fast but do not merit attention. *Nickel-brown*—Nickel fixed first by caustic soda, then oxidized with bleaching-powder solution, gives a brown very similar to manganese brown.

USE IN PRINTING.—The nitro-acetate is to be preferred. For alizarine one molecule of nickel oxide should be employed for every molecule of alizarine. The goods are printed, steamed, rinsed, soaped, and finally washed with cold water. The whites are very clear. Lime is to be avoided. Aniline orange gives a red-brown to orange. The whites are clear. Alizarine blues are very clear and resemble methylene blues, but are much faster. Cloth prepared with alizarine assistant is to be preferred, and this is true of the use of nickel in all cases. *Ceruleine* gives a yellow-green, and *gallozanine* a blue-violet. *Galleine* gives a good violet which is fast to soap but not to chlorine. *Gallofanine* does not give good results. *Persian berries* give a very fast yellow but not very clear, yet the results are excellent on the whole. *Cutch* gives interesting results. The shades are reddish-brown similar to those given by chromium, but purer and redder. For one hundred and twenty-five parts of cutch, fifty parts of nickel mordant, consisting of twelve and a half parts of chlorate, and thirty-seven and a half parts of acetate of nickel, are recommended.—*Zeit. f. d. Chemische Industrie.*

Exotic Flax.

Consul Williams, of Rouen, France, makes the following report, in part, to the Government concerning what he calls exotic flax, which must prove of great interest in view of its claims being very similar to those of ramie:—M. Jean de Turek, of Lille, France, who is a skilful manager of spinning mills, has brought to light a textile plant of Chinese origin, which has some analogy with ramie. He claims to have discovered a process for degumming this textile, which comes already decorticated, and to produce from it threads of great strength and beauty. He has termed this textile "Lin Exotique," in English "exotic flax." He claims for this material that in its native country its cost is 30 to 35 centimes (3d. to 3½d.) per kilog. (2.2 pounds), and 4d. to 5d. laid down at Marseilles, whereas flax costs, according to quality, from 1 to 2.5 francs (9½d. to 1s. 11d.) per kilog. The exotic flax, without assorting, is fit for the coarsest fabrics or the finest, the latter only requiring the usual more careful and complicated preparation. The finest lace, and the strongest cord, can be made from it, as well as an infinite variety of intermediate fabrics, such as table cloths, napkins, carpets, plush, wearing apparel, etc. He spins without combing, and thereby saves 40

per cent. of waste incident to flax combing. The material can be worked with the ordinary flax machinery. The whole secret lies in the preparation of the exotic flax. The textile can be mixed with flax, silk, wool and cotton. Its strength is wonderful, and a sewing thread can be spun which requires no twisting. The refuse is utilized and can be worked in the same manner as cotton, which it closely resembles. If desired, the long fibres can be broken up by an ordinary crusher and reduced to the usual length of cotton fibre. It could be cultivated in the United States, Algeria and other countries of similar climate.

The Junction Ironworks, Newton Heath.

We understand that these works and plant, which were, until recently, owned by the Junction Ironworks Company, Limited, have been purchased from the liquidator by Mr. Samuel Brooks, of the Union Ironworks, West Gorton, who intends to carry them on as a branch establishment. The works, which will employ some 500 hands, were commenced by Messrs. Evan Leigh & Son, the late Evan Leigh, author of the well-known work on cotton spinning, being the then senior partner. It is the intention of Mr. Brooks to utilise the newly acquired premises principally in the production of preparation machinery from new models, keeping the works at West Gorton, where about 1,000 hands are at present employed, for the making of "ring" spinning, &c., machinery.

Post Office Notices.

Parcels not exceeding 7 lbs. in weight can now be received at any post office in the United Kingdom for transmission to the British post offices at Constantinople and Smyrna via France. The following are among the special regulations and conditions to be observed:—For a parcel not exceeding 3 lbs. in weight, 2s. 4d.; exceeding 3 lbs., but not exceeding 7 lbs. in weight, 2s. 11d. Although the route via France is more direct, parcels for Constantinople and Smyrna will still be sent by steamer from Liverpool if prepaid at the following rates:—For a parcel not exceeding 3 lbs., 1s. 6d.; exceeding 3 lbs., but not exceeding 7 lbs., 2s. 6d.; exceeding 7 lbs., but not exceeding 11 lbs., 3s. 6d. In other respects the regulations for the transmission of parcels to Constantinople and Smyrna via Liverpool will apply to the transmission of parcels to those places via France. Under an agreement between the British and Japanese post offices, it has been arranged to increase the limit of size and weight allowed for packets of trade patterns or samples addressed to Japan up to the limits which have been adopted for patterns addressed to the Argentine Republic, France, Portugal, Belgium, Greece, Luxemburg, Switzerland (via France), and the United States of America. Henceforth, therefore, the maximum weight of each packet is raised from 8 ounces to 12 ounces, and the maximum dimensions from 8 inches to 12 inches in length, 4 inches to 8 inches in width, 2 inches to 4 inches in depth. In all other respects, the conditions regulating the transmission of trade patterns or samples to Japan through the post remains unaltered. Parcels not exceeding 6½ lbs. in weight are received at any post office in the United Kingdom for transmission to Portugal, Madeira, and the Azores, via France; not exceeding 7 lbs. in weight for transmission to Bulgaria and Servia, and not more than 11 lbs. in weight for Costa Rica. Parcels not exceeding 11 lbs. in weight are to be received at any post office in the United Kingdom for transmission to the Republic of Columbia. Parcel mails will be made up in London every alternate Thursday morning, the first was made up on the 8th March, for conveyance to Colon by the steamers of the Royal Mail Steam Packet Company.—*Board of Trade Journal.*

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the five weeks ending Saturday, March 31st, was 498. The number in the corresponding five weeks of last year was 543, showing a decrease of 45, being a net decrease in 1888, to date, of 14. In addition to these gazetted failures, there were 353 Deeds of Arrangement filed at the Bills of Sale Office during the same five weeks, making a total in 1888, to date, of 772. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, March 31st, was 1556. The number in the corresponding five weeks of last year was 1487, showing an increase of 69, being a net decrease in 1888, to date, of 116. The number published in Ireland for the same five weeks was 56. The number in the corresponding five weeks of last year was 90, showing a decrease of 34, being a net decrease in 1888, to date, of 60.

PATENTS.

Applications for Letters Patent.

Arrangement and construction of hooked frame or reel used in steaming fabrics. J. B. Norcliffe and N. Jessop, Halifax.	2nd Mar.	3,198
Appliances for flyer spinning. J. V. Eves, Halifax.	6th Mar.	3,420
Bobbins or spools for spinning. G. O. Boynton and F. Cooper, London.	6th Mar.	3,468
Bobbins' frame. T. W. Smith and G. Thomas, Kidderminster	9th Mar.	3,632
Belting. R. Simpson, Sheffield.	16th Mar.	4,079
Belt holders and shifters. U. H. W. Schenck, London.	17th Mar.	4,696
Belt fasteners. H. J. Haddan, London.	27th Mar.	4,703
Bobbins or beams for winding yarns and textures. T. Brown, London.	27th Mar.	4,701
Carding engines in which revolving flats are employed. T. Knowles and R. Tatham, Manchester.	27th Feb.	2,912
Construction of loom pickers. F. Craven, London.	28th Feb.	2,970
Cap spinning and twisting frames. L. Binns, London.	1st Mar.	3,153
Carding Engines. F. Wilkinson, Manchester.	5th Mar.	3,349
Continuous dyeing machines. J. Mycock, Manchester.	8th Mar.	3,559
Clip for machines for tentering and stretching woven and felted fabrics. T. W. Stead, Halifax.	12th Mar.	3,781
Cutting pile fabrics. M. Wright and J. Ferdinand, Halifax.	13th Mar.	3,843
Cut pile fabrics. A. Hind, Bradford.	14th Mar.	3,966
Cutting or shearing the surface of textile fabrics. W. and E. Kempe, London.	19th Mar.	4,229
Cutting and dividing double-piled fabrics. W. Smith, Manchester.	26th Mar.	4,565
Construction of apparatus for cutting piled fabrics. G. Rogu, Manchester.	29th Mar.	4,785
Construction and operation of heating and drying chambers. S. Ibeson, Huddersfield.	29th Mar.	4,815
Double edged lace. J. Fletcher and A. Saywell, Nottingham.	24th Feb.	2,745
Drying textile material in the skein. F. W. Petrie and J. Fielden, Rochdale.	28th Feb.	2,965
Dyeing or steeping, &c., fabrics. W. P. Thompson, Liverpool.	2nd Mar.	3,232
Damping yarns in looms. T. Watson, London.	6th Mar.	3,465
Dyeing apparatus. W. Mycock, Manchester.	7th Mar.	3,490
Dyeing wool, &c., in bobbins, hanks, and other aggregated forms. Messrs. Harmel, London.	10th Mar.	3,753
Double pile fabrics. E. Essers, London.	13th Mar.	3,908
Doubling or winding yarn from cops or bobbins upon spools. J. W. Foster, London.	16th Mar.	4,054
Drying fibres. G. White, London.	10th Mar.	4,081
Drying textile material in skein or hank. F. W. Petrie and J. Fielden, Rochdale.	27th Mar.	4,664
Dressing and winding on frames. H. Hartley, London.	27th Mar.	4,765
Dressing lace. T. N. Jordan, London.	29th Mar.	4,817
Finishing velvets, velveteens, &c. R. Dutton, Salford.	25th Feb.	2,871
Flyers and spindles used in certain machinery for preparing, spinning, and doubling cotton, &c. T. Oxley, Manchester.	14th Mar.	3,974
Fastening or joining tapes, bands, belts for driving spindles, &c. S. Rowbottom, Manchester.	24th Mar.	4,496
Fibre from Rhea grass. W. B. Nation, London.	24th Mar.	4,558
Feeding wool, &c., to carding machines and apparatus for cleaning, dressing, and removing burrs, &c., from the fibre. E. Wilkinson, Halifax.	28th Mar.	4,732
Grid for vertical cotton openers. J. W. Rothwell, Manchester.	15th Mar.	4,018
Inside tappet for weaving huck diaper, twill, plain cloths, which can be changed by weaver, when loom is in motion or stopped, from one pattern of cloth to another. W. J. Thompson, Belfast.	9th Mar.	3,624
Jacquard mechanism of looms. W. H. Moorhouse, Halifax.	3rd Mar.	3,265
Jacquards. J. Cooper, London.	13th Mar.	3,886
"Jerries" for shearing cloths, &c. J. T. Thornton, Halifax.	24th Mar.	4,504
Kidderminster, Scotch, or ingrain carpets. J. S. and S. Smith, Glasgow.	28th Feb.	2,964
Looms for pile fabrics. G. W. Sykes, Halifax.	25th Feb.	2,829
Looms for terries or pile fabrics. M. Dickie, Manchester.	25th Feb.	2,840
Loom shedding motions. J. F. Lee, G. Croll, and P. Forbes, Dundee.	29th Feb.	3,039
Looms for figured pile fabrics. Meers. Sallandrouze and Le Mouille, London.	1st Mar.	3,175
Loom temples. W. H. Taylor, J. Maynard, and H. Baskerville, London.	7th Mar.	3,531
Looms for cutting double pile fabrics. T. Norton and J. Wood, Leeds.	10th Mar.	3,724
Let-off mechanism for looms. R. S. Hattersley and J. Hill, Keighley.	26th Mar.	4,572
Mules for spinning. H. Ashworth, London.	7th Mar.	3,479
Measuring, marking, and stopping mechanism, for measuring spun and woven fabrics. A. Hitchen, Accrington.	14th Mar.	3,953

Mosquito nets (fabrics for). J. Eccles, Manchester.	22nd Mar.	4,389
Mules for spinning. P. Crook and G. Firth, London.	26th Mar.	4,586
Mules for spinning. G. Walsh, London.	27th Mar.	4,690
New kind of felt. M. Malzac, F. Gaudet, and A. Texier, London.	25th Feb.	2,868
Ornamentation of fabrics, &c. R. A. Gross, London.	24th Feb.	2,801
Opening and stretching fabrics. E. Weild, London.	25th Feb.	2,848
Operating shuttle boxes, checking the picker, and operating heads in loom. W. Longbottom, London.	8th Mar.	3,586
Printing calicoes, &c. J. Walker and H. Carver, Manchester.	25th Feb.	2,838
Pickers for looms. E. Bottomley and H. Townsend, Bradford.	5th Mar.	3,340
Positive picking motion for weaving narrow goods. W. Longbottom, London.	8th Mar.	3,585
Pile wire and cutter for use in looms for cut pile fabrics. G. Segsneider, London.	13th Mar.	3,907
Producing yarn or thread of varying thicknesses. J. Peate, London.	16th Mar.	4,091
Protecting fabrics under steaming process. R. Metcalf, Huddersfield.	20th Mar.	4,255
Pile fabrics by double cloth method. F. Robinson, Leeds.	24th Mar.	4,516
Rollers for stretching or expanding fabrics. W. Birch, Manchester.	2nd Mar.	3,180
Raising, leizing and kemping woollen cloths. W. Craven, Apperley Bridge.	28th Mar.	4,725
Shuttle-peg for shuttles for weaving. J. Hopkinson, Birstall.	29th Feb.	3,033
Spinning, doubling, twisting, or roving jute, &c. W. R. Laing, Glasgow.	29th Feb.	3,045
Shuttle tongues. J. Waddington, Bradford.	1st Mar.	3,121
Scutching, carding, or separating fibres. W. S. Archer, London.	1st Mar.	3,151
Shuttle for weaving dress goods, &c. A. Mitchell, Bradford.	2nd Mar.	3,204
Spinning and doubling fibres. G. Bernhardt, Manchester.	2nd Mar.	3,206
Scouring, washing, dyeing, and drying fibres. R. Cooper, H. F. Clayton, and G. H. Holroyd, Huddersfield.	8th Mar.	3,606
Stretching apparatus for wool spinning. J. Effenberger, London.	12th Mar.	3,811
Self-acting mules. J. Whitehead, London.	13th Mar.	3,878
Spinning mules. W. Hirst, London.	19th Mar.	4,203
Silver cans. L. Bridge, Accrington.	27th Mar.	4,644
Self-acting mules. J. Whitehead, Manchester.	27th Mar.	4,654
Treading, picking, let-off, and take-up mechanism of looms. R. L. Hattersley and J. Hill, Keighley.	29th Feb.	3,042
Twist lace machines. H. A. Fisher, London.	5th Mar.	3,346
Twisting or doubling yarn. G. Clegg, J. Thomas, and W. H. Harrison, Halifax.	8th Mar.	3,577
Twisting and doubling yarns of wool, &c. J. Farrar, Halifax.	14th Mar.	3,935 & 4,009
Threading loom shuttles. B. Dyson, Manchester.	19th Mar.	4,218
Traveller for ring spinning and twisting yarn. G. Kirkman, Halifax.	20th Mar.	4,250
Twisting and winding frames. F. R. Donisthorpe and J. Townsend, London.	24th Mar.	4,540
Velvets. J. Bamford and J. Wild, Oldham.	8th Mar.	3,573
Warp letting-off, treadle and crank motions of looms. C. Catlow, Halifax.	24th Feb.	2,765
Washing or cleansing wool, &c. J. and F. W. Petrie, Rochdale.	29th Mar.	4,786
Washing and scouring woven fabrics. T. W. Stead, Halifax.	10th Mar.	3,706
Weaving pile fabrics. G. Burtscheidt, London.	8th Mar.	3,587
Winding yarn or thread. J. Y. Johnson, London.	29th Feb.	3,104
Winding yarn. T. Oliver, Manchester.	3rd Mar.	3,285
Winding yarn or thread on bobbins, &c. J. W. Shepherd, W. Ayton and R. Clegg, Manchester.	6th Mar.	3,457
Winding yarn on paper tubes and bobbins therefor. C. Holdsworth, Halifax.	10th Mar.	3,694
Winding off yarn or thread from bobbins, &c. C. White, Manchester.	10th Mar.	3,704
Winding, doubling, twisting yarn or thread. T. and H. Harrop, Horbury.	21st Mar.	4,324

Patents Sealed.

1,776	2,985	3,050	3,713	4,750	12,304	13,405	16,725
16,726	421	996	2,018	2,376	2,455	2,518	2,539
2,577	2,592	3,152	5,450	11,612	15,809	15,258	1,529
2,236	2,642	2,595	2,989	3,883	7,257	7,550	15,178
15,654	16,029	16,132	2,243	2,354	2,942	2,970	3,011
16,144	16,161	16,201	16,286	16,940	193	336	6,955
16,492	185	2,857	3,282	3,297	3,306	3,307	3,368
3,374	3,380	3,635	3,657	3,871	13,689	1,727	3,484
3,501	3,633	3,680	3,715	3,742	3,905	4,967	6,740
7,687	12,423	15,432	15,459	15,961	16,422	16,514	16,853
16,942	16,958	17,082	17,106	2,484	2,727	3,692	3,820
3,859	4,172	4,806	13,059	15,364	17,029	17,239	17,295
17,486							

The Journal of Fabrics AND Textile Industries.

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Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office Orders to be made payable to H. & R. T. Loxd, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c.

The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cottons, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

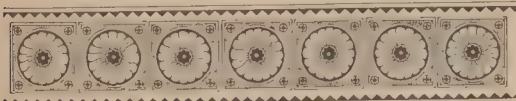
Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity.

Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication will be considered as offered gratuitously, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



Glasgow International Exhibition.

THE Glasgow Exhibition, opened by the Prince and Princess of Wales, on the 8th of this month, is likely to prove another of a series of most attractive and interesting displays of Home, Colonial, and Foreign contributions, in almost endless variety. The Glasgow people, who are justly proud of their city, and have used, and will continue to use, their best endeavours to render this enterprise a thorough success in every way, have subscribed a Guarantee Fund of £252,000. The exhibition is situated on the banks of the Kelvin—the river dividing the grounds into two sections. The stream has been widened and deepened, in order that it may be utilized as a show place for floating naval or torpedo boats, life-saving apparatus at sea, &c., in the manufacture of which Glasgow is the centre. Opposite the principal entrance rises Gilmorehill, which is laid out in public gardens, on the summit of which are the University buildings, so well known to visitors to the city. From the terraces of the Exhibition, the mountains of Dumbarton and the highlands of Argyshire are plainly visible, forming a picture calculated to claim the admiration of all lovers of natural scenery. On our first special plate, we give a view of the Exhibition Buildings.

Textile Fabrics and Clothing.

Foremost amongst the exhibits of textile goods, from South Britain, we may mention those of carpets. Messrs. John Crossley and Sons, Limited, Halifax, show Wilton carpets, seamless bordered carpets, which have been, until recently, woven in breadths and sewn together. Messrs. Tomlinson and Adam, of Kidderminster—"Royal" and "Victorian" Axminster carpets and hearth-rugs, a chenille Axminster carpet, woven in one piece, and mats of different kinds. Messrs. M'Lintock and Sons, Barnsley, have an exhibit of patent down quilts and clothing. Messrs. Lister and Co., Bradford, a case of embroidery and knitting silks, flosselle, machine and hand-sewing silks for the leather trade and for general uses. Messrs. John Hadwin and Sons, Knebworth Mills, Halifax, show samples of silk waste in various stages of manufacture, spun silk for lace, hosiery, plush and mixed goods, as well as fabrics made from spun silks. Messrs. Steiner and Co., Church, exhibit Turkey red goods, yarns, and discharge and calico prints, for which they are justly celebrated. Messrs. J. Johnson, Low, Allsop and Co., Bolton—Allanbras, toilet and honeycomb covers, quiltings, toilet, Marseilles, honeycomb and fancy quilts, &c. Messrs. W. O'Hanlon and Co.—printed, unfading reversible blinds, woven and striped blinds, tapestry curtains, printed cottons and muslins, velvets, plushes, brocades, silks, and brocatelles. Messrs. Ryland and Sons, Limited, Manchester—fancy cotton goods and quilts, dyed satens, Turkey red quilts, mantles, various kinds of calicoes, ready-made clothing, &c. Messrs. Horrockses, Crewdson and Co., Manchester—calicoes of different descriptions. Messrs. Heywood and Heywood, Manchester, show velveteens in the various processes of manufacture, and a variety of velveteen piece goods, including the "Planet," the "Heywood," the "Classic," and the "Athletic Stripe." Messrs. H. Marriot and Co., Manchester, have an exhibit of dyed, printed and fast-coloured linings for home and export trade, fancy coloured cottons, Oxford and Harvard shirtings, ticks, drills, denims, &c. The successors of Henry Pease and Co.—dress goods, men's coatings and serges, as made at Darlington. Messrs. Barlow and Jones, Manchester—different classes of white and coloured quilts, toilet covers, damasks, towels, quiltings, sheets, &c. Messrs. R. Byrom and Sons, Delph, near Manchester, show fancy reversible and other shawls, made from Vienna wool, and cashmere. Messrs. Baldwin and Walker, Halifax, exhibit Scotch flanneling and other wools for hand and machine hose, underclothing, and fancy work. Messrs. W. Holland and Sons, Manchester, show botany worsted yarns, welt and warp in cops, or sized on beams, spun without oil in all counts, suitable for worsted coatings, French merinoes, cashmeres, and cashmere hosiery yarns. Mr. H. J. Hahlo, Manchester, exhibits tapes and braids of various kinds, union, sarsnet, taffeta, China silk, and cotton ribbons. Amongst the North British manufacturers, we may mention Messrs. J. and P. Coats, Paisley, who are showing goods in process of manufacture from the raw material to the finished article, sewing and crochet cotton, machinery in motion for finishing the same, and a model of the Ferguslie new spinning mill, composed of more than 50,000 spools of thread. W. Stirling and Sons, Glasgow, have an interesting and varied exhibit of yarns and cloth in different stages of preparation for Turkey red, Turkey red and other coloured yarns and twills, cambrics, dimities, plain and printed velvets, lace curtains, printed bed quilts, garments and Indian dresses, handkerchiefs, &c. Messrs. J. Templeton and Co., Glasgow, show Axminster, Wilton, and Brussels carpets. Messrs. John Shields and Co., Perth, bleached, cream and loom damask napery, diapers, crumb cloths, and stair damask covers, coloured cotton covers, napery and towels with names and crests. Messrs. W. Strang and Co., exhibit their patent velvet gauze curtains, plain and fancy muslins, zephyrs, canvas, handkerchiefs and leno harness. Messrs. John Brown and Son, Glasgow—plain and fancy muslin by power-loom for curtains and dresses. Messrs. Black and Wingate, Glasgow, show white, printed, and embroidered handkerchiefs. Messrs. J. Johnston and Co., Glasgow, volunteer and military kiltings and trouserings, Scotch clan tartans, travelling mounds, ladies' clan and fancy woollen shawls. Messrs. J. and P. Haggart, Glasgow—native and foreign wool fabric for domestic use, crumb-cloths, tweeds, tartans, rugs, knitting wools. Messrs. Thomson, Bros. and Co., Glasgow, exhibit yarns in Turkey red, Turkey pink, indigo and fancy colours, as well as dyed silk piece goods. Messrs. Fraser and Smith, Inverness—homespun and cheviot tweeds, and Vienna and cashmere travelling and carriage rugs. Mr. R. W. Forsyth, Glasgow, have an exhibit likely to claim much attention, it consists of "Hygienic" woollen under garments for ladies' and gentlemen's wear, made of the finest natural coloured wool, in the various processes of manufacture, from the raw material to the finished article, as well as machines showing the process of making the same. They also exhibit boys' clothing, showing the latest styles of dress, dress and undress Highland costume, sailor, man-o'-war, court, and other fancy suits. Messrs. Gibson, Bros. and Co., Glasgow, have a case containing curtains, upholstery decorations, embroidered, and dress fabrics. Messrs. Inglis and Wakefield, Glasgow, printed calicoes and art muslins. Messrs. A. Mitchell and Sons, Glasgow, fancy cotton dress goods, zephyrs, Oxford and wool shirtings, tartan, unions, and all wool dress goods. Messrs. Smith and Co., Paisley, have an exhibit of tapestry goods, including table covers, curtains, Madras muslin curtains, antimacassars, &c.; they have also shawls, rugs, &c. Messrs. D. G. Howatt and Co., Glasgow, show various kinds of curtains, lace, plain and fancy muslin. Messrs. Fleming, Reid and Co., Greenock, have various kinds of worsted and woollen yarns, Welsh and natural wool, stockings, ladies' underclothing, gloves, caps, and all kinds of hand knitted and fancy work. Cox Bros., Dundee, show specialities for which the firm is noted. Messrs. Nairn and Co., Kirkcaldy, exhibit some of the floorcloths and linoleums for which they have a world-wide reputation. Messrs. W. and J. Hammond, Ayr, Scotch and Teviot blankets, and white and Shetland plaidings. Mr. John Cairnie shows wool, union and Oxford shirtings, dress cloths, and men's serges. The following firms from Ireland are also exhibiting:—The Convoy Woollen Company, Limited, Raphoe—Irish manufactured woollen goods, &c. Messrs. Hicks, Steen and Co., Belfast, show a trophy of cotton thread on spools, in different colours, and their various shades, all of Irish manufacture; raw cotton in its various stages of manufacture, in glass boxes round the dome, the whole forming a most creditable display, and one calculated to draw much attention from visitors.

Textile Machinery, &c.

MESSRS. W. AND J. GALLOWAY AND SONS, MANCHESTER.

THE GALLOWAY BOILER.

Messrs. W. & J. Galloway & Sons are exhibiting the front and back portions of one of their well known Galloway Boilers, the dimensions of which are 30 feet by 8 feet. This system of boiler has been in use for about 30 years, having been improved in many points of detail from time to time—the latest advance being the upward curve of the under surface of the back flue, and the radial arrangement of the cone tube. The alteration thus effected gives more space for cleaning and examining the lower portion of the boiler, and allows the insertion of an increased number of cone tubes. The tubes themselves, moreover, are now made entirely by machinery, and with the flanges square to the centre line, which causes them to be interchangeable, and reduces the strain upon the iron in the manufacture. It has been ascertained in practice that a Galloway boiler, whilst being in the highest degree powerful, is correspondingly economical. A boiler 28 feet long by 7 feet diameter, when driving a condensing engine in fair order, is fully equal to 300 indicated horse-power, but, in many cases, one such boiler has regularly driven over 350 horse-power with compound engine, at a working pressure of 80 lbs. per square inch; this is considerably higher than can be obtained from a boiler of the ordinary construction. As a tribute to

this class of boiler, we may state that by official tests which were carried out by a special committee, and entirely without any interference or control being possible on the part of the makers, the Galloway boiler evaporated 1172 lbs. of water, at a temperature of 212° per lb. of coal; more over, the quality of the steam generated was carefully tested, and, in addition to the highest rate of evaporation, the Galloway boiler was ascertained to give the driest steam. This is a matter of the utmost importance, as with perfectly dry steam there can be no risk of break-down occurring to an engine from that most frequent cause, priming. A test was also carried out at the mill of C. R. Collins, Esq., Hele, Devonshire, under the immediate supervision of the editor of *Engineering*, at which a result equal to 1283 lbs. of water at the same temperature per pound of Welsh coal was attained. Messrs. Galloway and Sons have large works at Ardwick, Manchester, for the manufacture of boilers of every description; these works contain the most complete plant for this purpose, there being special machinery for self-dividing and drilling the rivet holes in the plates after they are put together, tools for flanging the furnace plates, steam stamping presses, &c., &c.; and at these works, during one year, 338 boilers, weighing 3,770 tons, have been constructed, which averages more than one 11-ton boiler for every working day in the year. This in time of comparative depression is an indisputable proof of the progress which is being made, and of the firm hold which the Galloway boiler is taking in the manufacturing districts. In all, up to the end of 1887, 7,100 boilers had been made. A testing room, containing one of Kirkaldy's most recently improved machines, has been erected at the works, and no boiler is constructed until trials have been made to ascertain the ultimate strength and elasticity of the material used in its construction. Purchasers can any time be furnished with the results of the above tests in the case of their own particular boiler. In addition to the great facilities for constructing boilers so rapidly, there are generally kept in stock, ready for immediate delivery, from 40 to 50 boilers of all sizes and descriptions, in order to avoid, as far as possible, the inconvenience that is sometimes felt in having to wait until a boiler can be made; and should a boiler of the size required not be entirely finished, one can generally be supplied in two or three days from the large number which are always in course of construction at the above works. It will be remembered that the whole of the steam required at the Royal Jubilee Exhibition, Manchester, 1887, was provided by 10 patent Galloway boilers, 30 feet long and 8 feet diameter, made of steel plates, to work at 100 lbs. pressure.

THE ILLUMINATED FOUNTAINS.

The whole of the work in connection with the Illuminated Fountains has been designed and carried out by Messrs. W. and J. Galloway and Sons, and is the most complete and effective installation of the kind that has yet been erected. Messrs. W. and J. Galloway and Sons had the contract for somewhat similar fountains both at the Colonial Exhibition, South Kensington, in 1886, and at the Manchester Exhibition, at Old Trafford,

last year. The present fountains are the result of the experience gained in both these undertakings, making them more effective and beautiful than any of their predecessors. Not only have Messrs. Galloway and Sons executed the machinery portion of the work, but also the excavating, the buildings, and everything else connected with the installation. A full description would take up too much space, but we may say that an almost inexhaustible amount of mechanical and electrical skill and ingenuity have been expended in order that electrical fountains may be produced, such as those which were viewed by hundreds of thousands at Manchester last year.

THE GALLOWAY ENGINES.

The pumps used for the fountains are capable of delivering 200,000 gallons of water per hour, and are driven by one of Messrs. Galloway's recently improved Horizontal Compound Superposed Engines, such as are made by them for ordinary factory purposes, in fact, the engine is provided with a pulley grooved for rope driving, so that, if the pumps are disconnected, it is an engine which may be adapted for any ordinary driving purposes. It has high-pressure cylinder, 14 inches diameter, and low pressure, 24 inches diameter, both having a stroke of 3 feet, and suitable for indicating 180 horse-power. The engine is fitted with trip gear, cutting off the steam instantaneously at any point of the stroke, the admission being controlled directly by the governor. The electric current for the lights under the fountains is furnished by two of Messrs. Siemens' B3 dynamos, each equal

to a current of 450 amperes, with an electro motive force of 250 volts, when running at 300 revolutions. These dynamos are driven by an engine of identically the same size as the pumping engine, but running at a higher velocity, and fitted with a somewhat different valve gear.

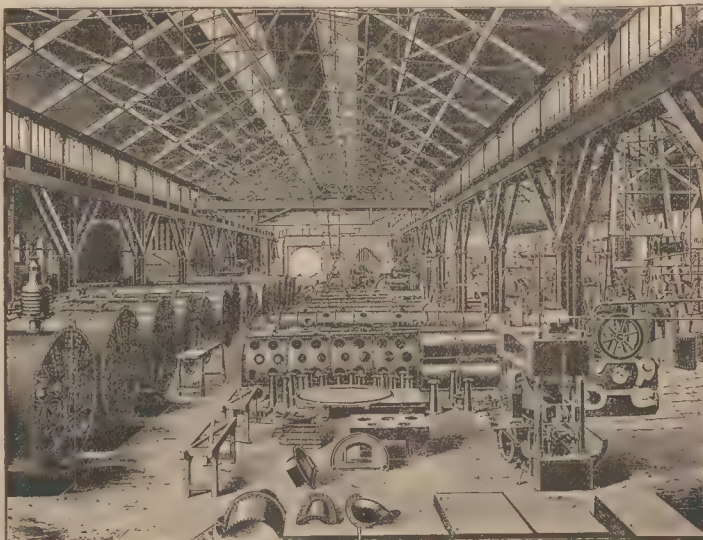
THE ROSSENDALE BELTING COMPANY.

The Rosendale Belting Company exhibit, at stand 229, their Anti-Friction Edged Hair Belting, Patent Woven Seamless Hose, and Patent Traces for waggons and other such purposes. The anti-friction edged hair belting—as its name implies—has its edges so constructed as to resist the action of the strap fork, the absence of which improvement in woven belting detracts greatly from its utility. We have in our hands a little work issued by this Company, containing about 25 pages of testimonials from firms interested in many of the various industries of this country.

All testify to the good results derived from the use of this belting, amongst which we noticed four which had been received from the electricians and the superintendent of machinery at the Manchester Exhibition. For durability, economy, and strength, this belting has an undoubted claim upon users, as it remains uninjured by the action of water, steam, heat, or acids. The belts may be made of any length, consequently, they require only one joining, hence smooth running is ensured. There are other advantages, such as the great biting power, which might be mentioned, but it is scarcely necessary to say more on this occasion with reference to a product of such utility. Besides hair belting, the Company are makers of cotton and American duck belting, which may also be had with the anti-friction edge. The patent woven seamless hose for fire brigades, and for every purpose to which leather hose can be applied, is made to stand from 250 to 300 lbs. pressure to the square inch, according to the quality—two varieties being in use. The great strength, combined with the cheapness of this material, must claim the attention of users of such products. The patent traces manufactured by the Company should be seen by manufacturers. These are made of a fabric similar to the belting above named. They are neat, of the greatest possible strength, are uninjured by heat or water, and their appearance is quite equal to leather. The Company make patent belting fasteners, which are specially of service in joining their own belts, suitable fasteners being supplied for the various drives for which belts may be required. The Company have Depôts in most of the cities and large manufacturing towns; their chief office is at 20, Rook Street, Manchester.

MESSRS. J. DONALD AND SON, GLASGOW.

Messrs. J. Donald and Son, Cadogan Street, Glasgow, exhibit Aland's patent air propellers, Well's unbreakable pulleys, and shafting, &c. The air propeller is specially adapted for drying and ventilating purposes in cotton, worsted, woollen, and other factories, dyehouses, bleach works, &c. It is already well known by users of this class of mechanism, as large numbers are now in use at numerous establishments throughout the textile districts. It has been shown at various exhibitions during the past 3 or 4 years, where



Messrs. W. and J. Galloway and Sons' Boiler Works.

it has met with much attention, and diplomas have been awarded to the makers of it. The "unbreakable" pulleys which are made by A. C. Wells and Co., of Manchester, are already so well known and appreciated that there is no necessity for saying much with respect to them. They are produced in various sizes, from 12 in. to 20 feet diameter, of wrought iron, and, in consequence, are less than half the weight of those made of cast iron. They are guaranteed to run at high speeds without danger of breakage. They are constructed with a rim of metal of an equal thickness, with arms to correspond in strength, and this gives them a true balance when running. The pulleys are wrought in halves, and can consequently be fixed easily. Being much lighter in weight than cast iron, the friction on the bearings and shafting is less than is generally the case with ordinary pulleys. As to price—in the smaller sizes, they are a shade dearer than those of cast iron, but this is more or less counterbalanced by a less expenditure of power when running. In the larger sizes, the prices are considerably under those of cast iron. They can be made with either round or flat faces, specimens of both being exhibited.

MESSRS. J. LEEMING AND SON, BRADFORD.

Amongst the textile machinery, none is more worthy of notice than Messrs. Leeming and Son's exhibit at Stand 455. Although only showing one loom, the firm made early application for a large space in order to ensure a fairly representative display of the specialities in looms, for which they have gained a high reputation. They were, however, disappointed, and had to make the best of the small space allotted to them, which was only capable of accommodating the one shown. This is the four box loom illustrated,

which combines many patent motions, all positive in their action. These may be briefly enumerated:

—a patent open shed dobby for from 12 to 40 shafts, a patent drop box motion, a patent reversing motion, a patent letting off motion and taking up motion, and a patent picking motion. Taking these in order, we will first mention the open shed dobby, which is noticeable for its simplicity, as there are neither teeth, catches, needles, weights, nor springs in its mechanism, and not a single rivet is used in its construction. All its centres are 12 inches in diameter. It has two cylinders, each indicating for alternate picks. The pegs act direct on the lever, giving motion to the heads and, therefore, it is impossible to have wrong lifts of the heads. The dobby is quite independent and separate from any other part of the loom, and all the gears may be brought level, so that the weaver standing in front of the loom can draw each heald separately. The dobby is quite over its work and is, therefore, all the more suitable for the weaving of heavy fabrics. The drop box motion is, as above indicated, quite separate from the dobby, enabling the time of shedding to be varied—sooner or later—to suit different cloths. The boxes move with particular steadiness, whether rising from one to four, or only a single box. The movement being eccentric, with an escapement both in its up and down motion. The reversing motion enables the weaver to reverse the loom, pick by pick, so that broken picks are easily found. The letting off motion is very simple, and is remarkable for its swiftness of parts, and is so arranged that, when the loom is reversing, the warp is taken back to its proper tension. The taking up motion is arranged and driven by two bevel wheels from the low shaft, with a counter shaft having a worm upon it, gearing into a worm wheel. This was formerly worked with a ratchet wheel and pushing catch. By this simple contrivance, and the aid of the letting off motion, the reversal of the loom takes the cloth back pick by pick until the broken pick is found, when the loom proceeds as before. Thus, faults in the cloth are easily prevented. In the picking motion, short picking sticks are used, and these are not lengthened by increasing the number of heald shafts. Such are a few of the main features of the most simple, substantial, and useful loom we have seen for some time; it is the outcome of improvement upon improvement, and of practical minds able to grasp the requirements of the advancing age in which we live. The firm have exhibited at previous Exhibitions, and have gained various honours. At the Royal Yorkshire Exhibition last year they made a good show and were awarded a gold medal. We advise visitors to the exhibition to inspect the loom, which is running steadily at a speed of 86 picks per minute. It is weaving a Scotch mixture tweed with five shuttles. Should further particulars be required, Messrs. Leeming and Son, North Vale Works, Bradford, will be glad to give all necessary information.

THE SINGER MANUFACTURING COMPANY.

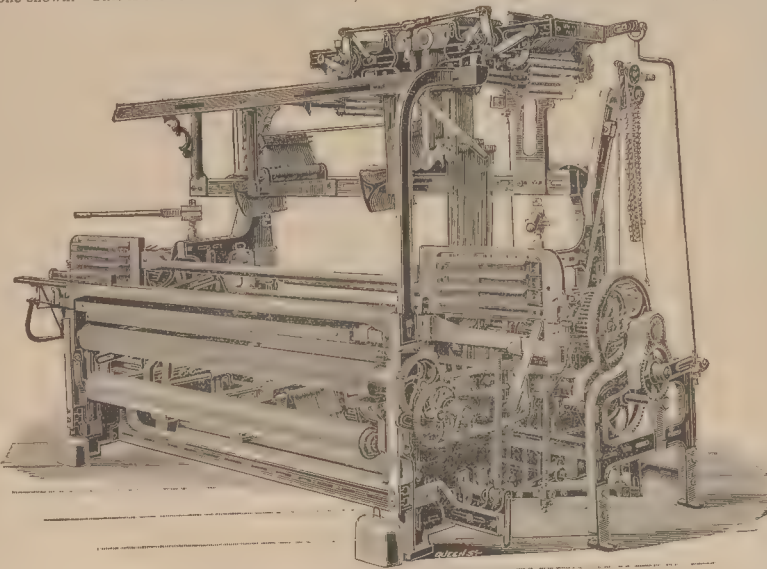
The Singer Manufacturing Company have two stands, one of which is devoted to showing mechanisms for domestic purposes. At the other stand, situated in the machinery section, are machines for manufacturing purposes, and as these more especially appeal to our readers, we will take them first in order. The Multiple Machine for sewing—or to use the term more generally understood in the trade—for lacing jacquard cards is here shown. We mentioned this machine during the Exhibitions last year. Since that time, the invention has found much favour amongst lace curtain and carpet manufacturers. Its use should be adopted in all factories where large quantities of jacquard cards are used. A Carpet Machine is also shown, which is a great novelty. The two widths of carpet to be sewn are placed together and suspended, and the machine, which is portable, may be seen travelling along the two edges, doing the work with great ease, rapidity and efficiency. This machine is eagerly sought after by upholsterers and house furnishers. It is capable of doing the work of eight hand sewers. A large Belt Machine is also shown, as well as Twin Buttonhole Machines for making buttonholes in clothing and boots. The novelty in connection with this pair of machines is that one operator can attend to both. The above machines are to be seen at work. Limitation of space has prevented this firm from showing half their manufactures. Amongst the machines thus excluded is the largest ever made, requiring a standing space of 14 feet. The capacity of this machine enables it to sew a belt 8 feet wide and 1 inch in thickness. The weight of the machinery is over

5 tons. At the stand devoted to domestic machines, of which they have a great variety, stitching of every conceivable kind is shown, and samples of work of an elaborate description are on view. Amongst others will be seen smoking caps, tea cosies, cushions, &c., in abundance, done in various designs, in arrasene, and other kinds of work, and there are also shown several specimens of marguerites and roses—in buds, full blown, and half-blown. None but those who have had an opportunity of inspecting the work can have any idea of the artistic effects that can be produced on the sewing machine, which, we think, might be turned to profitable account by enterprising textile manufacturers. The fastest machine in the world, known as the "Lightning stitcher," which is capable of going at a pace of over 4,000

stitches per minute—equal to doing a mile of stitching in 112 minutes, will also be seen here. The machines at this stand are driven by electricity, and the operators are engaged in making various articles. At other stands in the Exhibition, the Singer sewing machines are used for a variety of purposes. The machinery exhibited by this firm appears to us to have been brought to the highest pitch of perfection, and, judging by the cups and medals which have been awarded at previous Exhibitions, and which are on view in Glasgow, we are not alone in our judgment, whilst the large factory of the Company at Kilbowie, near Glasgow, shows the importance to which the sewing machine industry has attained.

MESSRS. J. TULLIS AND SON, BRIDGETON, GLASGOW.

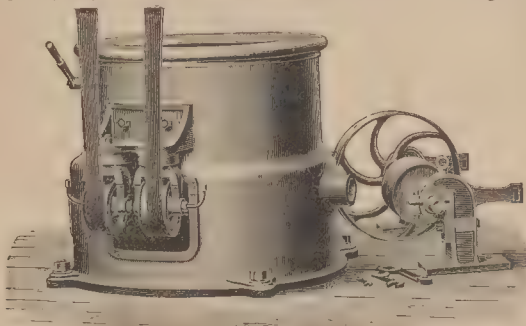
This firm have an excellent display of leather beltings of various kinds, as well as other descriptions of leather goods. They have two 14 inch double orange tanned main driving belts, transmitting power off Messrs. Robey and Co.'s, and the Westinghouse Co.'s engines, and they are doing their work admirably. On their stand, they have patent orange tanned leather flat and chain beltings, gun hide flat and chain belts, oak tanned goods of various kinds, special oxidized waterproof cotton belts, llama hair belts for outside and other special work; patent V-shaped hide rope, also V-shaped wooden rope with friction leather outside, and solid square leather rope of oak, and patent orange tan leather, all for main driving; patent leather chain belting, arched to suit curve of pulley; patent leather chain belting, thick-sided and tapered, for half twist drives; hose piping for brigade and other purposes; leather fire buckets; leather laces; pump butts; leather and buffalo pickers, buffalo skeps, and general mechanical leathers.



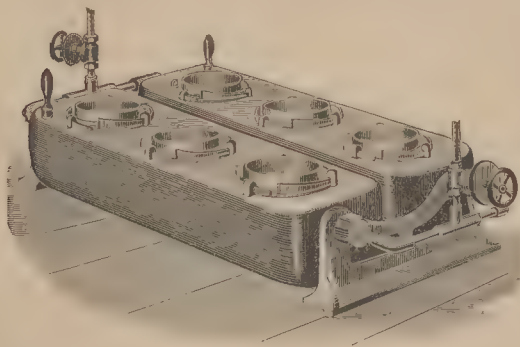
Messrs. J. Leeming and Son's Loom.

THOMAS BROADBENT AND SONS, HUDDERSFIELD.

Messrs. Thomas Broadbent and Sons, Central Ironworks, Huddersfield, are exhibiting Dawson and Broadbent's patent apparatus for heating dye pots by steam. They are also showing other specialities for which they have gained a high reputation. These consist of a 60 inch direct driven hydro-extractor for drying wool, cotton, silk, and every description of textile fabrics; an improved 30 inch hydro-extractor, under driven by belt, the cage being composed of perforated tinned copper plates. This method of driving dispenses with cog wheels, friction arrangements, and also with the accompanying noise and dirt. This is a very substantial machine, specially adapted for use in laundries, an illustration of which is here given.



They have on view a 48 inch patent direct steam driven Centrifugal Machine, requiring no foundation, and specially constructed for use in sugar refineries, chemical works, and similar industries. The last two not specially appealing to the textile trades we will pass, and proceed to give descriptions of the dyeing apparatus and the 60 inch hydro-extractor. Dawson and Broadbent's dyeing apparatus is intended for use in technical laboratories and private works, where the matching of colours and sample dyeing have to be done, and where it is often absolutely necessary that the experiment be conducted in a glass or porcelain vessel, copper or other metals having a tendency to decompose the dye liquor, and, therefore, to give misleading results. Hitherto, dye-pots for this purpose have been heated by the employment of glycerine or some other liquid, capable of being heated to a temperature of about 300° Fahr. without decomposing, and into which the dye-pots are placed, such liquid being heated by means of gas or other fuel, burnt directly under the bath. This method of heating the dye bath is attended with many disadvantages, such as overheating the glycerine, and thus causing it to decompose and to throw off an offensive smell; want of control over the combustion of the gas, whereby the boiling is very irregular; the large quantity of glycerine required in which to immerse the dye-pots; and, in addition to these, gas is more expensive than steam. It is to overcome these difficulties that the



apparatus has been designed; this can be done in the following manner:—Firstly, by heating the glycerine by steam instead of gas; and secondly, by having each porcelain vessel to fit in a separate cavity rather larger than itself, in which the glycerine is held, so that a very much less amount of the fluid will suffice. By experiment, it has been found that a steam pressure of 50 lbs. to the square inch will carry sufficient heat for the purpose. The apparatus consists of a steam-tight vessel, in which one or more cavities are formed, of a size and shape corresponding to the dye-pots, and in which glycerine is placed. Upon steam being introduced into the steam-tight vessels, it surrounds and envelopes the cavities containing glycerine, and heats the latter to a suitable temperature. The dye-pots are placed, or fixed, in the glycerine, which, being hot, soon causes the dye liquid to boil. By this means a regular and steady boiling can be maintained, which is of great importance in experimental dyeing. The dye-pots are arranged in rows of three, which can be tilted in their casting, and thus emptied without removing the pot from the glycerine. By this means, the glycerine cannot waste away, and therefore requires no renewing. Single dye pots can be obtained, and these also may be emptied as above described. They are

made in all sizes from 1 to 12 quarts capacity, the larger sizes being specially applicable to dyers of fancy goods, as well as for sample and experimental work. The arrangement will be found a great acquisition in any dyehouse, and will supply a long felt want, as absolutely clean dyeing will result from the use of the apparatus in either of the forms described.

The 60 in. direct driven hydro-extractor for drying wool, cotton, silk, and every description of textile fabrics, is fitted with a galvanized steel cage, and is suspended on links, which dispenses with massive foundations. It is driven direct by a small steam engine, which, from its peculiar construction and accuracy of balance, can be run at a very high velocity without any liability to get out of order. The reciprocating parts are made very light, and of carefully selected material; all the wear can be easily taken up, and the nuts or cotters taking up such wear can be firmly locked. The spindle is made of steel, with a patent balanced crank forged on. It is provided with two long conical bearings, firmly fixed in the centre casting of the machine, the



wear of which bearings can easily be taken up without there being any liability to shake loose. The lubricating of the machine is all done from the outside, that of the crank-pin and eccentric being automatic in its action; by a simple contrivance, every time the machine is started, these parts take up a few drops of oil, and to this the remarkable durability of these

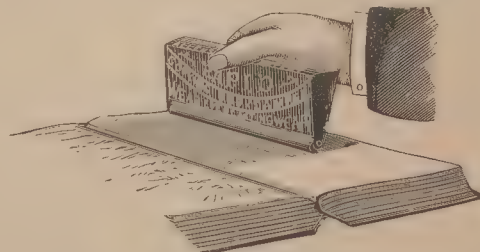
machines is in a great measure due, the necks being kept cool, and no oil wasted. The firm have made a speciality of hydro-extractors for the last 12 or 13 years, and the experience thus gained has been turned to account in improving their machines even in the most minute particulars, and thus, in the one under notice, there are many points of importance which we may mention with benefit to our readers. The cost of maintenance is reduced to a minimum, the wear and tear and cost of repairs are very slight, no foundations are required, and therefore vibration is avoided. There is no friction gear and no belts are required, the machine being driven direct by steam. These are advantages which, if considered, will place Messrs. Broadbent's hydro-extractors in an enviable position amongst machines of that class. The large number of testimonials which they have received all speak of their value in terms difficult to surpass. In addition to those shown at Glasgow, the firm are exhibiting three machines at Melbourne.

THE ALLEN MACHINE COMPANY.

The Allen Machine Company on Stand No. 1,090, are showing their Patent Gumming Machine, and also their Patent Letter Book Damper. During the Manchester Exhibition, we gave a description of this firm's exhibit. The Company had not then been long formed, and the general public had not become familiar with the articles they produce. Since that time, a great number of gumming machines and letter book dampers have been sold, and we have no



doubt the exhibit at Glasgow will still further increase their demand. The gumming machine is a simple but an ingenious arrangement by which labels of every variety can be coated with gum, or have one edge only so treated. In factories where large quantities of goods are put up in parcels or boxes, or in any of the numerous forms in use, these machines are more expeditious, and, at the same time, cleaner than the old method of



hand gumming, whilst in the office they are useful for innumerable purposes. All the parts can be easily removed, cleaned, and replaced. We give an illustration of this useful machine, as also one of the letter book damper; which latter effectually dispenses with the old system of brush, bowl, and blotter. The damper consists of a light metal reservoir, along the bottom is an

aperture or slot, in which is fixed a piece of felt. The reservoir is filled with water; this filters through the felt upon an indiarubber roller, which, being passed over the letter books, as shown in the engraving, imparts just sufficient moisture to the paper to allow of a letter being copied perfectly. The demand for an article so useful should be very great, and we can quite understand that the Allen Machine Company are doing a large business in it. The office of the Company is at 3, George Street, Halifax.

THE "STURGEON" PATENT SILENT GAS ENGINE.

The Sturgeon patent silent gas engine is made and exhibited by Messrs. Henry Wallwork and Co., Union Bridge Ironworks, Manchester. The advantages of gas engines over steam engines for many purposes are well known, and therefore it is unnecessary to enter into comparison here. Visitors to the Exhibition examining this engine will find it to be free from certain objections urged against many other gas engines. It is easy to start, possesses great regularity of speed, and requires a low pressure of gas to run it. On the mixed charge of gas and air being ignited, the expansive force is received equally and simultaneously upon two pistons, the one moving up, and the other down, in a vertical cylinder. Each of these pistons separately and independently imparts this force to one of a pair of cranks on a double crank-shaft, to which it is connected by means of a sway beam and connecting rod. The cranks on the double crank-shaft are set opposite to each other. It will thus be seen that, not only are the principal working parts of the engine perfectly balanced but, the expansive force of the charge is received equally and in opposite directions upon the crank-shaft, by which means the crank-shaft and bearings are relieved from the detrimental effects of a constant repetition of sudden shocks being thrown on to them all in one direction. The charge is drawn into a horizontal cylinder, in which runs a very light piston (actuated by one of the cranks) which on its return stroke delivers the charge into the working cylinder, midway between the two pistons. The perfect admixture of gas and air is thereby effected. This charge is then rapidly compressed and ignited, the shaft receiving one impulse for every revolution. The patent method adopted for ventilating the igniting pocket ensures perfect and regular ignition even at the highest speeds. The expansion of the charge is carried down almost to atmospheric pressure before opening to the exhaust pipe, thereby extracting all the good that can be got out of the gas, and rendering the exhaust practically silent. All parts can be readily got at. The pistons can be slipped out of the cylinder and put back in a few minutes, there being no cylinder covers to take off nor joints to undo and make good again. The shaft is carried out a sufficient length on both sides of the bed, so that the pulleys may be put on either side of the engine to suit the convenience of position. The necessary strains are distributed through a number of bearings, each of which bears its proportion of the work to the relief of other parts. The result of wear and tear is thus diminished, and the durability of the engine greatly increased. By the adoption of two pistons, each doing an equal share of work, the shaft may be run at a very high speed without necessitating an excessive piston speed. The pistons and slide valve are each oiled independently by means of Wallwork's patent automatic lubricator, which feeds the oil drop by drop as required by these parts. All other parts requiring lubrication are furnished with capacious oil cups.

MESSRS. PENMAN AND CO., GLASGOW.

Messrs. Penman and Co., Caledonian Iron Works, Dalmarnock Road, Glasgow, show two Lancashire steam boilers, working in the machinery section. They are each 28 feet long by 7 feet 6 inches diameter, having two internal flues, 3 feet diameter, fitted with five Galloway tubes. The longitudinal seams of the flues are solidly welded, each ring being joined together transversely by means of an expansion hoop, so as to resist collapse. The longitudinal seams of the shell are double butt strapped inside and outside, with four rows of rivets, and the circumferential seams are double rivetted. All the rivet holes have been drilled from the solid plates after they have been bent into shape. The edges of the plates are planed, and the fire holes in the ends have been bored out by special machinery. The boilers are made throughout of "Siemens" mild steel, and they include all the most modern improvements for a daily working pressure of 120 lbs. per square inch.

MESSRS. ROBEY AND CO., LINCOLN.

Messrs. Robey and Co., Globe Works, Lincoln, exhibit a complete compound engine, capable of working up to 350 horse-power, fitted with Richardson and Rowland's patent triple expansion gear, for securing economy in fuel and regularity in running. The engine is also so arranged that, when driving dynamos for electric lighting, the point of cut-off can be automatically varied to suit either varying current or varying E.M.F. By this means the engine can be run either at a constant speed with a compound-wound machine, or at a varying speed to suit the requirements of the current of a shunt-wound machine. When used as a driving engine for factories or mills, it is provided with an arrangement by which the engine can be instantaneously stopped from any floor, if required, in case of accident to life or machinery. They also have a 40 horse-power compound "Robey" engine, erected upon one massive foundation plate, which is capable of working up to 150 horse-power, it is fitted with Richardson's patent automatic governor and cut-off gear; a high speed horizontal compound engine, developing 20 horse-power, and running up to 400 revolutions per minute, fitted with Richardson's patent electric regulator for maintaining either constant speed or current; a six horse-power (nominal) vertical engine, with inverted cylinder and medium stroke, suitable either for electric lighting or industrial purposes; fitted with patent automatic governor cut-off gear. They have on view a horizontal high speed engine, single cylinder, suitable for 100 lbs. pressure, running at 300 revolutions per minute, and developing

20 horse-power; a vertical high speed engine, single cylinder, suitable for 100 lbs. pressure, running at 300 revolutions per minute, and developing 20 horse-power. Both of the above-named engines have their working parts entirely enclosed, and running in a bath of oil; they have very large bearing surfaces, and are accurately balanced for running continuously at high speed without needing lubrication or attention; a double cylinder vertical engine, fitted with reversing gear, suitable for winding or hauling purposes, or for general driving; and a ten horse-power (nominal) double cylinder "Robey" engine and boiler combined, for working up to 30 horse-power. All its working parts are combined upon one base plate, which also forms a foundation for the boiler. This engine is specially suitable for working in places where great power is required in a very small space, and for export where there is difficulty in getting skilled labour for erection.

MESSRS. TURNER BROS., SPOTLAND, ROCHDALE.

This firm have an exhibit of asbestos in different stages of manufacture, as well as other goods suitable for mechanical purposes. The stand contains asbestos in the crude state, and in the fibre; yarns, cordage, cloth; packings in great variety. Asbestos jointing material, in various forms, for steam and hydraulic purposes; asbestos compound cement for steam and water joints; asbestos non-conducting composition, for covering boilers and steam pipes; ground asbestos, miscellaneous packings for locomotive, stationary, and marine engines, also for pumps; elastic tubular cotton ring-packings for shifting-boxes; elastic metallic washers, for pipe joints; the "Gripwell" solid woven hair belting, for main driving and general purposes; woven seamless hose for fire brigades; and the "Gripwell" belting syrup.

Other Interesting Exhibits.

There are numbers of first class exhibits which call for special attention, but the space at our disposal does not admit of more than a passing allusion to them, but, in our next issue, we hope to do them justice. That well known firm, Messrs. Hutchinson, Hollingworth and Co., Dobcross, near Oldham, show a couple of the looms for which they have gained a great name. These are as follows:—Hollingworth and Knowles' patent open shed woollen loom, 90 in. reed space, 16s. harness, single beam, six boxes at each end. This loom is capable of weaving with 11 shuttles, and specially adapted for all classes of woollens; speed ranging from 70 to 85 picks per minute; one Hollingworth and Knowles' patent open shed worsted loom, 90 in. reed space, 36s. harness, with double beam motion, four boxes at each end, this loom is capable of weaving with seven shuttles, and is specially adapted for all classes of worsteds, speed ranging from 75 to 90 picks per minute. Then that well known firm—Messrs. George Hattersley and Sons, Keighley, Yorkshire, show a variety of looms which claim more than an average amount of attention. These are a four and four shuttle rising box loom of 16 shafts, weaving tweeds; a four and four shuttle rising box loom of 36 shafts, weaving fancy worsteds; a six shuttle revolving skipping box loom of 16 shafts, weaving tartans; a six shuttle revolving box loom of 16 shafts, weaving fancy dress goods; a six shuttle revolving box loom of 16 shafts, weaving handkerchiefs; and a plain one shuttle loom of 16 shafts, weaving fancy dress goods. Messrs. Isaac Whitesmith and Sons, Govan Street Foundry, Glasgow, show an improved power loom for weaving fancy dress goods, to work pick and pick, having three boxes on each side; also a seven shuttle box movement, to be used in weaving with seven colours. In machinery for finishing textile fabrics there are good exhibits. Messrs. James Saville and Sons, Adelphi Bowl Works, Salford, Manchester, show, amongst others, a cotton bowl, for calendering or finishing; yarn preparing rollers, &c. Messrs. Urquhart, Lindsay and Co., Blackness Foundry, Dundee, show a patent hydraulic calender mangle, with pumps and accumulators for finishing linen, jute and cotton fabrics, fitted with a revolving frame, so arranged that the operations of learning, finishing and stripping may be effected simultaneously. An exhibit worthy of notice is that of Messrs. Smith and Christie, 181, Trongate, Glasgow, which includes a piano card cutting machine; jacquard machines for figured weaving, an improved wall engine, wrap reels and testing machines for yarns, patent temples, shuttles, springs and general fittings for looms; also a working model of a patent power loom. Patent mechanical stokers are shown by Mr. Thomas Henderson, 40, Castle Street, and Trueman Street, Liverpool, and by Mr. James Procter, Hamerton Street Iron Works, Burnley. Over 4,000 of these stokers are now in use which speaks for their general excellence. The Worthington Pumping Engine Co.—a description of whose pumping engine we gave in a recent number, are showing their patent pumping engines, boiler feed pumps, independent condensers, water ballast pumps, water meters, &c. Fire engines and appliances are shown by Messrs. Shand, Mason and Co., 75, Upper Ground Street, Blackfriars Road, London. These consist of an improved patent equilibrium steam fire engine, No. 3 size, capable of discharging 800 gallons per minute, and of throwing to a height of 190 feet, with 7½ patent inclined water tube boiler, capable of raising steam in from 6 to 7½ minutes; an improved patent equilibrium steam fire engine, No. 1 size, capable of discharging 350 gallons per minute, and of throwing to a height of 160 feet through a 1½ inch jet pipe, fitted with patent inclined water tube boiler and all modern improvements; an improved London brigade manual fire engine, complete, with all modern improvements; patent instantaneous hose couplings, and a selection of London brigade hand pumps, and other fire extinguishing apparatus.

The Late Alderman Robert Hall, J.P.

The late Alderman Robert Hall, J.P., of Bury (whose portrait we give below), after a very varied life of 74 years, passed to his rest on the 15th ultimo, leaving a wife, a family, and a large circle of friends to regret his loss. It has been said that "he was a man favoured by fortune," may we not rather say that the habits of steady industry, perseverance and thrift, acquired very early in life, laid the foundation of his after success in business. Then also he commenced his career as an iron master at a time when competition was much less keen than in these days, and planted his feet firmly on the ascent when money could be made by those possessing an average amount of business capacity accompanied by determination to overcome difficulties. Mr. Hall was born in 1814, and at an early age entered the household service of the late Rev. Geoffrey Hornby, rector of Bury. Leaving this situation, he became an apprentice to Mr. Wm. Brooks of that town, who employed a number of handloom weavers, some of whom worked at their own homes, others at the house of the master, where the apprentices were invariably employed. In time, R. Hall was able to earn 16s. per week, but only 8s. went for payment of his own work, the remainder going to the weaving master. In those days good weavers could earn £2 per week. Those of our readers who can recall the mode in which this branch of business was transacted 60 years ago, and also until a much more recent date, will remember how apprentices, as well as those who had completed their apprenticeship, were required to carry woven pieces, strapped like a knapsack to their backs, to the mills—the masters of which had ordered the goods. Mr. Hall used to relate how he had once to carry a piece three times to the mill, because on examination it was found to be deficient. Later in his youth, the subject of our sketch went to Holker's warehouse, where woollen pieces from the mills were made up, and, after some time, he left work for two months' schooling, studying under Mr. Thomas Crompton, of Bury. At the age of 16 he commenced to serve an apprenticeship at Newbold's Ironworks—now Messrs. Holgate and Fishwick's, and at the expiration of his term, he accepted the position of first mechanic for Mr. Barnes, of Halshaw Moor, where he remained twelve months, after which he was employed in Rochdale, and later at Kay's Foundry in Bolton Street, for two years. Mr. Hall was next engaged for eight years at Messrs. Walker and Hacking's, but, owing to a slight dispute, he, along with three other leading workmen, left this firm, and having saved money and gained much experience in these various situations, Mr. Hall and they commenced business in a small way on their own account in 1844. One after another, and from various causes, the partners successively retired, until he alone was left, and, as his sons were approaching manhood, he probably did not feel it necessary to renew similar connections with other people. Hope Foundry, of which the deceased gentleman was a founder, has had, and still possesses, a wide reputation for the construction of preparing machinery and looms of all kinds, as well as machines for silk, worsted, woollen, jute and linen. Mr. Hall was a liberal in politics, and very early began to take an interest in public affairs, both local and imperial. In connection with the former, he has played a prominent part during the past 40 years. He was a member, and subsequently chairman, of the Bury Improvement Commissioners, and, on the incorporation of the town, entered the Council, successively rising to the

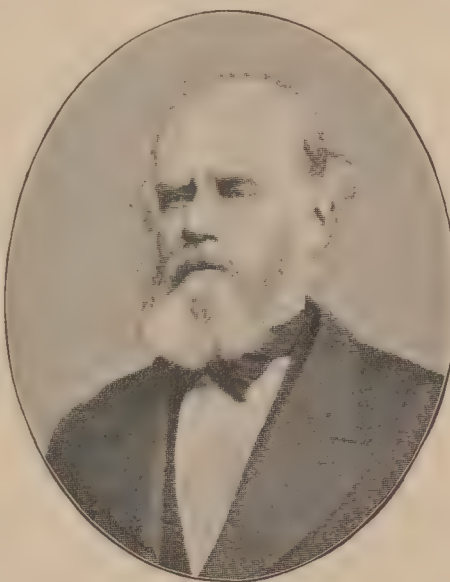
position of alderman and Mayor, filling the latter office in 1881. He was also a magistrate of his native town, and a Justice of the Peace. On the 4th March last year, Mr. and Mrs. Hall celebrated their golden wedding, when over 700 men, women, and children, employés of the firm and their dependents, were treated at the Co-operative Hall in honour of the event. This pleasurable celebration was made additionally interesting by the presence on the platform of about fifty ladies, gentlemen, boys, and girls, nearly all of whom were sons, daughters, sons-in-law, daughters-in-law, and grandchildren of Mr. and Mrs. Hall. A handsome presentation was made to the worthy couple on the occasion. Much sympathy has been expressed with the family of Alderman Hall in their bereavement, and the funeral which took place on the 19th ultimo was attended by the workpeople, the members of the Town Council, the Borough Magistrates, Representatives of the Colden and Trevelyan Clubs, as well as by the numerous friends whom the deceased had gathered round him during his eventful career.

MONTHLY TRADE REPORTS.

Wool.—The London Sales, which closed on the 5th inst., have generally shown animation, and prices, especially towards the close, were higher. The next series will commence about the 19th of June. At the Scotch sales, wool sold very slowly at about average rates. In the Yorkshire districts, there has not been much speculation. Some classes of wools have been easier to sell, notably merino and the finer qualities of English wools, for these rather harder prices have been paid. The animation towards the close of the London sales has had a beneficial effect on prices. The yarn trade both for home and export account has been generally quiet, and prices all round have been rather weaker. Spinners complain much that, in the face of the fact that wools are quotably dearer, they are unable to procure adequate rates for their yarns. The piece trade has also been quiet, although coatings have sold fairly well for the United States.

Woollen.—All interested in the production of this class of fabrics make complaints of the few orders to be had, there having been little or no improvement in any department during the past few weeks. The demand for worsteds of a fancy nature keeps tolerably fair, but, for other classes, the orders have been few. The tweed branches, although some really good fabrics, as regards pattern, colour, and texture, have been produced, bring but few orders, the stocks in the hands of merchants being so greatly above the average, for the time of the year, that they are very chary of giving out orders. The demand for cloths for the ready-made clothing trade is not so good, although the houses engaged in this branch have been busy recently for the Whitsuntide demand. Prices generally show no quotable alteration.

Cotton.—An improvement in both the yarn and cloth trades may be noted during the past month, the export branches having shown a marked advance, but the home trade has been about as usual, owing, principally, to the wintery weather which is prevailing so late in the season. Both spinners and manufacturers are fairly well supplied with orders, but at prices that are not very remunerative. Any attempt to raise rates has a tendency to stop business, and, in the face of this, producers are compelled to accept the prices offered. The wages question in Lancashire is a source of trouble to spinners and manufacturers, as they maintain that, in the present state of prices, any advance is out of the question.





London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1878.



Philadelphia, 1876.



Dublin, 1885.



Leeds, 1875.



HEATS THE FEED WATER WITH THE WASTE HEAT TO A TEMPERATURE CONSIDERABLY ABOVE BOILING.

CONTRIBUTES GREATLY TO THE DURABILITY OF BOILERS.

Can be applied without stoppage of works. Has been in operation to every description of Boiler for upwards of 35 years.

IMPROVEMENTS have just been MADE in the CONSTRUCTION and DETAILS of the MACHINE.

The Pipes are cast VERTICALLY and in DRY SAND MOULDS.

THESE ECONOMISERS ARE NOW CONSTRUCTED FOR EXTREME HIGH PRESSURES.

PROVISION MADE AGAINST INCRUSTATION AND MUDDY WATER.

1887. New Patents. 1887.

No fewer than **SIXTEEN PRIZE MEDALS** have been gained by the Economiser, the highest award being obtained in every case for sound workmanship and superiority of design.

Original Inventors, Patentees, and Sole Makers,

EDWARD GREEN & SON,

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WORKS:—WAKEFIELD, YORKSHIRE.

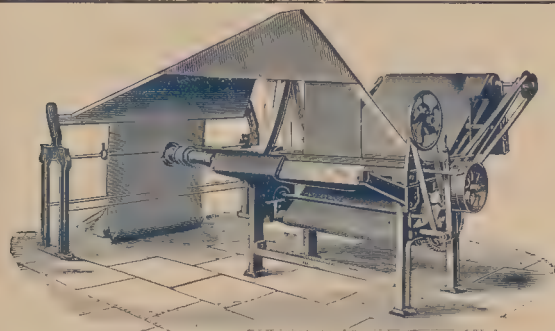
J. H. RILEY & CO., BURY, near Manchester.

Specialities.

**RILEY'S PATENT FULL WIDTH
BURR EXTRACTING OR CARBONISING MACHINE**
for Dyed and Undyed Woollen Goods.

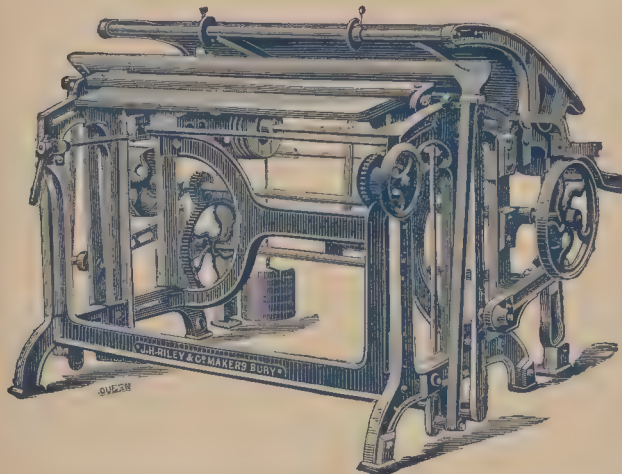
WET FINISHING MACHINE
for Bradford Dress Goods.

CALENDERS for Satteens, Italians, and every class of Textile Fabrics.



ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing Depot, Pimlico, and to the Indian Government. References to a large number of machines at work.

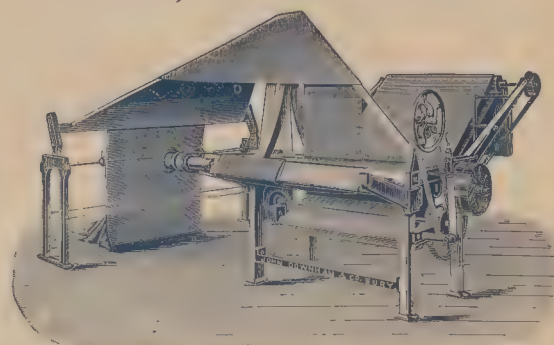


RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.
We have some scores of these machines at work.

**J. H. RILEY & CO.,
BURY, NEAR MANCHESTER.**

JOHN DOWNHAM & Co. BURY, near Manchester.



ELDER'S RIGGING MACHINE,
WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

IMPROVED CUTTLING MACHINES
For Folding Single and Double Woollens and Worsted.

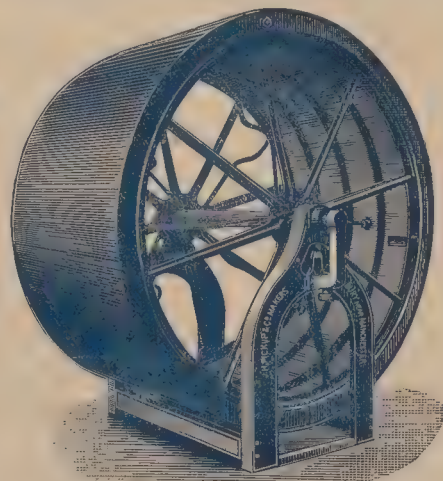
STEAM DRYING MACHINES,
WITH TIN AND COPPER CYLINDERS.

Calenders, Beetles, Dye Becks, Dye Jigs, &c.
Prices and Drawings on application.

J. H. PICKUP & CO., (Successors to JAMES ANKERS)

TIN-PLATE WORKERS, COPPERSMITHS, & C.,

Britannia Works, BURY, near Manchester,
Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,
For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for
Ring Frames,
Mules, Throstles,
Winding and
Warping Frames

We have made a
speciality in Tin
Rollers, knowing
the importance of
Machinists and
Mill Owners hav-
ing a good and
true Roller to run
the speeds that
are now required.
Our Rollers are
made from the best
sheets, and put
together by very
efficient workmen.

LARGE STEAM DRYING CYLINDERS,
Any diameter up to 12-feet, and any length, either in Tin or Copper.
SINGLE CASED OR CAVITY CYLINDERS made on the most approved principle.
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.

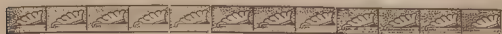
THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

MAY 10th, 1888



INTERNATIONAL EXHIBITION, GLASGOW, 1888.





ORIGINAL DESIGNS.

Our first page is this month occupied by an illustration of the Glasgow International Exhibition, and we must, therefore, ask our readers to turn to our second plate, where will be found a design for a Damask.

On our third plate is a pattern for Tapestry. This consists of narrow vertical stripes, which would look effective as a curtain. The stripes also offer suggestions for other uses.



FASHIONABLE * DESIGNS.

Sutting.

No. 524.



Design.

Warp:—1 end Dark Olive mixture 10's.
1 " White "

Woven:—1 pick Dark Olive mixture 10's.
1 " White "

Draft 2 ends in a heald all through.

2,048 ends in warp; 32 ends per inch; 16 picks per inch; 8 healds; 8's slay; 4 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight 20 ozs.

Fancy Trouserings.

No. 525.



Draft.



Pegging Plan.

Pegged to fall.

Warp:—

- | | |
|---|------------|
| 1 end Dark Slate worsted 2/52's. | |
| 1 " Black worsted 1/52's, twisted to Light Lavender | } 7 times. |
| 1/52's, 14 turns per inch. | |
| 1 " Dark Slate worsted 2/52's. | |
| 1 " Black worsted 1/52's, twisted to Light Lavender 1/52's, | } 7 times. |
| 14 turns per inch. | |
| 6 " Smoke 2/52's. | |
| 1 " Dark Crimson, 2/52's. | |
| 13 " Smoke 2/52's. | |
| 1 " Dark Crimson 2/52's. | |

☒ Crimson ends to be put where indicated in the draft; Claret picks where indicated on the pegging plan. Clear finish to 52 inches. Finished weight, 18 ozs. per yard.

No. 526.



Design.

Warp:—

- | | | |
|---------|-------|---------------------|
| 10 ends | White | woollen, 12 skeins. |
| 4 " | Brown | " " |
| 10 " | White | " " |
| 2 " | Brown | " " |
| 4 " | White | " " |
| 2 " | Brown | " " |

32 ends.

Straight Draft.

Woven all Brown Weft, 12 skeins.

2,048 ends in warp; 32 ends per inch; 32 picks per inch; 8 healds; 8's slay; 4 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight 24 ozs.

No. 527.



Pegging Plan.



Twist end.

Draft.

Twist end.

Turn even.
Put the twist ends where indicated in draft.

Warp:—9 ends Grey Mixture worsted 2/48's.
20 " Black worsted 1/48's, twisted to Slate worsted, 148's, 16 turns per inch.
11 " Mixture worsted, 2/48's.

4,760 ends in the warp; 80 ends per inch; 30's slay; 4 ends in a reed; 504 inches wide in the loom. Weft, Black woollen, 20 skeins; 56 picks per inch; 52 inches wide when finished. Clear finish. 16 ozs. per yard when finished.

Dr. Clayton's Fabric Tables, Scales, Weights, and Steel Die, to which we have previously drawn attention, continue to command a ready sale. Our readers can procure them through us, post free, in this country for 10s. 6d., or we will send them free to the United States and Canada for \$3.

12th MAY, 1906



TAPESTRY.

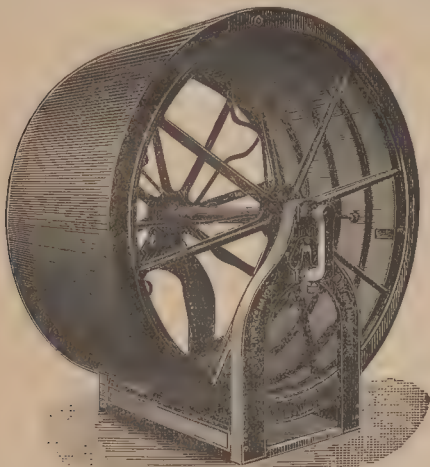
fluctuations of the ampère-meter indicator is decidedly less than in gas engines. For engines of the type tested by us, it is evident that the employment of petroleum, even at the price here quoted, will compare favourably with gas in this and other countries, at any price above 3s. 6d. per thousand cubic feet. There can be scarcely any limit to its sphere of usefulness." Mr. Joseph Edmondson is the sole agent for the whole of Yorkshire, and he will be very pleased to show the engine at work to any of our readers in the district, and any further particulars may be had from him. The address is 36, Sunbridge Road, Bradford.

The Terrot Machine.

This circular machine, which we illustrate on preceding page, is now largely in use in Germany, France, etc. In construction it has the large loop wheel which is known as the Stuttgart loop wheel, the axle of which is not horizontal but inclined. The sinkers or platines are held in position by guide plates, of which there are two. The driving wheel is conical, and driven by a circular rack on the needle bar, in order to turn this loop wheel. The sinkers are of a peculiar shape, being so constructed, and so fixed, that they are first pushed forward above the needles, then lowered, and in revolving they lay the loops and then draw back, laying the new loop under the beads, and leaving the needles again clear. The presser wheel is fixed immediately behind this wheel, while at the back are vertical jacks, which push forward the old loops on to the needle beads as they are pressed. The needles are pressed, and the loops landed while the new loops are held under the needle beads by the sinkers, thus preventing any of the new loops from falling back. This process is performed in these machines in a remarkably small space, several actions being performed within the space of a few inches of the circumference. A knocking-over cam is fixed to knock over the stitches, and an extra clearing wheel is sometimes added to ensure this being perfect. Apparatus are attached to this machine for the purpose of giving equal tension to the thread, and for the regulation of the thread for fine or stout qualities. Tuck presses can also be used, whereby many interesting patterns can be made, as well as attachments for making fancy mantle cloths, Astrachan, loops, checked and striped fancies, backed cloths, etc. A simple contrivance is added for the stopping of the machine whenever a single thread may break. If, as in some fabrics, from four to twelve single threads are used, the breaking of any one of these, will, by this means, stop the machine, at the same time throwing out the knocking-over cams, and thus preventing any loops being pressed over, thereby causing no defect in the fabric. An attachment for the stopping of the machine when a needle breaks is a very clever contrivance. The additional patent of a special winding-up tackle, for winding into rolls the fabric as it leaves the machine, is a special feature of this machine, as the terrot frame is the only kind of French frame offering this advantage, which is a great improvement on the old. The yarns on the frames are always used dry, and need no lathering. This has been found an item of importance by all those who use woollen costume yarns. The Jersey cloths so largely imported from Germany into this country are, we are told, made upon this frame. Messrs. H. Wildt and Co., Well Street, Bradford, who are the sole agents in this country, have shown us the machine at work, and have also drawn our attention to specimens of hosiery and Jersey cloths, and also cloths suitable for men's wear. These are of almost every variety, both plain and backed, some having fancy patterns, and curled and Astrachan effects, which may be all made on one machine by the assistance of design or plush wheels.

Steam Cavity Drying Cylinders.

At the recent Exhibition in Manchester, amongst the exhibits which attracted much attention from those interested in sizing, bleaching and such like operations, was a large steam cavity drying cylinder, made and exhibited



by Messrs. J. H. Pickup and Co., Britannia Works, Bury, a firm who have made a speciality of this class of mechanism, and have, after much thought, brought it to great efficiency. That cylinder, illustration of which is given, was 9 feet in diameter, 5 feet in length, with 6 in. steam space, but they are

made up to 15 feet diameter, and to any desired length. The outer body is of the best quality of copper sheets, and the inner body of tin sheets. The steam space is guaranteed to be of the best charcoal iron sheets, tinned over. In their construction, advantage has been taken of the knowledge of weak points in cylinders in general use, and these have been obviated. In the old style, the steam was carried by cast iron arms, but this caused more or less contraction of the material, with the result that the cylinders were speedily out of order, and, therefore, a source of trouble and expense. This weakness has been entirely obviated by the ironwork being put together in joints or sections in such a manner as to allow of contraction, and the steam is conveyed by copper pipes of the required strength, so arranged as to send the steam along the surface of the cylinder. The steam space is made in a most substantial manner, and is calculated to stand much wear and tear. For sizing, bleaching, drying, &c., at once, the cylinder is calculated to do its work efficiently. This firm also make ordinary copper drying cylinders suitable for bleachers, calico printers, or dyers. All cylinders of this kind made by the firm have applied to them all the latest improvements. The bodies are rolled on their improved rolling and planishing machine, and the internal work is of the very best description. Every cylinder is tested at a great pressure before being sent out. They also make tin rollers for ring frames, and, knowing the high speed required for spinning purposes, they fixed at the Manchester Exhibition two special machines, both of which were run by steam power, at from 800 to 1,200 revolutions per minute, without sensible vibration. Messrs. Pickup and Co. make tin and copper specialties of various kinds for different operations in spinning, carding, manufacturing, bleaching, dyeing, printing, &c., of cotton, woollen, worsted, silk, and other yarns and fabrics, and those engaged in any of the above industries should procure a catalogue of their varied appliances.

The "Alma" Lock Nut.

We herewith give an illustration of the "Alma" Lock Nut, patented by Mr. E. Hawks, and manufactured by Messrs. Horton and Sons, Alma Works, Darlaston. This form of bolt and nut has been tested for over six months on the fishplates of one of our main lines of railway, and has given the greatest satisfaction, for, whereas the ordinary nuts in use require attention every few days, the "Alma" nut required no attention during the whole time of testing. Our intention in bringing it before our readers is not, however, with regard to its usefulness for railway purposes, but rather in reference to its suitability for textile machinery, where great strain or vibration takes place. It will be obvious to anyone who understands "nuts," that, being perfect as a railway nut, it must commend itself for every class of machinery. It can, of course, be made in any size required, the one we inspected being about two inches long. The main features of the patent are contained in the thread and the nut. The screw threads are those known as the buttress type. These threads having their bearing surfaces at right angles to the axes, or direction of strain, do not tend to stretch or burst the nut, nor to generate reacting pressure and friction, as with the V thread. The nut has a split in one side which is made slightly smaller than the bolt, fitting just sufficiently tight to enable it to be screwed up with an ordinary spanner. The nut may be run down by hand by the aid of a small key made of steel wire bent at right angles, and having one prong flattened and tapered a little at the sides. By inserting this key in the slit of the nut and turning it slightly round, the nut may be easily run on or off by the fingers. One key will, of course, fit any size of nut. This form of nut is, moreover, easily manipulated in the case of its being rusted upon the bolt. A wedge inserted in the slit enables the threads to be oiled, and the nut removed, whereas, in others, force must be used, resulting in the destruction of the nut and bolt. This form of thread allows of all the stress being used for tightening purposes, instead of a large proportion being wasted on the nut or locking device, as is usual in many other forms of lock nut. The lock nut can be supplied in iron, steel, bronze, or brass. The nut answers admirably every requirement of a perfect lock nut, and should have an extensive sale. The makers will be pleased to forward samples on application.



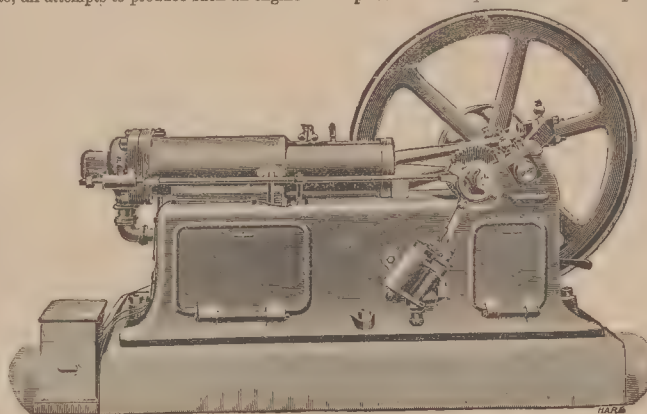
A new fabric, which, if proved to be what is claimed for it, will have an effect upon the silk market, has been discovered by a French chemist. It is an artificial fibre strongly resembling silk. It is obtained from collodion to which has been added some perchloride of iron, and a little tannic acid. The solution is passed through a fine hole into some water which contains nitric acid. As the fluid comes in contact with the water, it sets immediately, and is drawn off through a space of dry air. The material is of a grey or black colour, looks and feels like silk, and remains uninjured by ordinary fluids, and although it is made from a most inflammable compound, analogous to ordinary gun cotton, the fibre is said to burn without the flame spreading.

MACHINERY, &C.

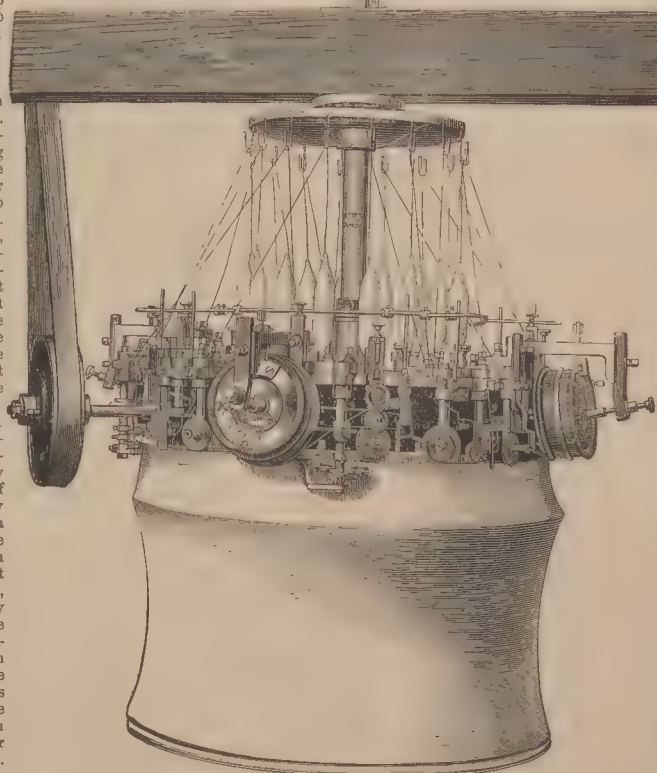
Priestman Bros.' Petroleum Engine.

The engine which we illustrate below has all the advantages of an ordinary steam engine, the motive power being obtained from the commonest petroleum. Hitherto, all attempts to produce such an engine have failed, but, judging from the one we recently saw running at Mr. Edmondson's, 36, Sunbridge Road, Bradford, the inventors have succeeded in producing a really wonderful engine. The petroleum used in generating the power is such as can be bought at any oil or ironmonger's shop. This is placed in a small cistern inside the foundation of the engine. The oil is injected in the form of a spray into the cylinder, where it is exploded in a similar manner to the gas in a gas engine. The engine is very easy to manage, there being no risk in leaving it unattended. For the benefit of those who imagine there may be any element of danger in the oil, it is necessary to state that it is non-explosive, in fact, Mr. Edmondson immersed a lighted lamp in a can of the oil, when the lamp was at once extinguished. To start the engine, it is only necessary to heat the vapour iser a few minutes, and to admit a small quantity of oil into the cylinder by taking a turn or two of the fly wheel. The engine is entirely self contained, the water tank forming the foundation, and there are neither water, exhaust, nor other pipes besides those to be seen in the engraving. The piston requires no oiling, the petroleum vapour supplying all the lubrication necessary. We may also state that insurance companies accept it at ordinary rates. It will be obvious to all that there are many purposes for which the petroleum engine will be most useful, as, for instance, where there is no gas. Under such conditions, gas engines are out of the question, but a petroleum engine may be used anywhere. The engine we saw was working an installation of electric light, and we may say we never saw a steadier or a better light, in fact, we have seen the same installation worked with one of the best gas engines at present made, and the result was not nearly so good. The inventors have already received many testimonials speaking in high terms of the engine, they are also in possession of reports of practical experiments made with the engine, by such eminent authorities as Sir William Thompson, F.R.S.S. &c.; Sir Samuel Canning, M. Inst., C.E.; Boverton Redwood, Esquire, F.I.C., &c.; and Messrs. H. Alabaster, Gatehouse and Co.; who are unanimous in praise of the engine. In order to place our readers in possession of the opinions of these gentlemen, we give a few extracts from their reports. Sir William Thompson says:—"I made careful tests on a 6 horse-power engine. After

seeing it started and stopped several times, and kept running on the brake for an hour, at $7\frac{1}{2}$ horse-power, and for two hours at 6 horse-power, without measuring the oil, I gave it exactly an hour's run with the brake loaded slightly more than for 6 horse-power, and with arrangements to measure the oil accurately. The result was that the engine ran with very admirable regularity at from 158 to 160 revolutions, doing 6.43 horse-power on the brake. The quantity of oil used was very exactly 11 pints, being at the rate of 1.71 pints per hour per brake horse-power. This equals about '85 of a pint per indicated horse-power per



The New Petroleum Engine.



The "Terrot" Knitting Machine.

this is at once evident from the fact that no license is necessary for its use or storage. There is little or no residuum, the whole of the oil being consumed, the regularity of running at any or no load is very marked, and although the explosion occurs only once in two revolutions, the variation in speed as observed by the

hour, or 1.69 pounds per hour per brake horse-power, which seems to me to be remarkably good economy, considering the great difficulties which had to be overcome in using the combustion of oil directly as a motor." Mr. Boverton Redwood says:—"I have concluded an experiment with the Priestman engine, with the object of placing myself in a position to state whether the engine is capable of being efficiently driven with the petroleum oil of commerce. * * * As the result of my inspection, I have no hesitation in stating that Messrs. Priestman Brothers have solved the difficulties attaching to the direct employment, as a source of power, of the ordinary petroleum oil of commerce. The disadvantages attending the use of the highly inflammable product of petroleum, hitherto used in petroleum engines, have been on more than one occasion forcibly brought to my notice, and I have taken occasion to point out the great superiority which would be presented by an engine capable of being efficiently driven by the combustion, in the cylinder, of ordinary refined petroleum or kerosene; for such oil can be obtained in the most remote districts all over the civilized world, and can be safely stored and handled in sufficient quantities without the observance of special precautions. I am therefore of opinion that the Priestman petroleum engine will be found of great utility and commercial value." The third report is that of Sir Samuel Canning and Messrs. H. Alabaster, Gatehouse and Co., who speak in the following favourable terms:—"It appears that the cost per actual horse-power is approximately 1½d. per hour, with oil at 6½d. per gallon, but as the probabilities are greatly in favour of considerable reduction in its price, it would seem that in the near future a very great economy will accrue from the employment of this engine. We would forcibly draw attention to the fact that the patentees and manufacturers of this motor have succeeded in employing the common petroleum oil of commerce, all other attempts in this direction, so far as we know, having hitherto been baffled. The importance of



The Trade of the World.

IN SWEDEN.—A Stockholm correspondent says:—"Let me repeat that persons wishing to travel in Sweden for commercial purposes should bear in mind that they must fulfil certain formalities, the neglect of which will inevitably entail a tolerably heavy fine. The foreigner, or even the Swedish subject who resides abroad and does not contribute to the taxes of the country, if he visit Sweden with or without samples, for the purpose of trade, must on his arrival hand in a declaration to the tax collector in the nearest town, stating how long he intends remaining in the country. At the same time, he pays a sum of about £5 10s. for the privilege of carrying on commercial transactions for a period not exceeding three months. If he desire to enjoy the right beyond that time, he is called upon to pay a further sum of about £2 5s. per month. The traveller receives a quittance on a printed form which serves as a license, and if found offering foreign goods, or stipulating the sale of such, without having complied with the requisite formalities, he is liable to a fine varying from about £5 10s. to £28, besides having to pay the tax. These fines are divided between the Treasury and the district where the infraction of the law took place. These regulations are not, however, applicable to Norwegian subjects selling Norwegian products. The authorities are very vigilant on this point, and it is said that five convictions have taken place within as many weeks."

TRADE IN SERBIA.—As Serbia will shortly be accessible by rail from Salonica, a Bucharest correspondent says it is expected that the import trade of that country will be greatly increased before long. It is believed that British and French products will gain ground at the expense of the Austrian exporters, who hitherto have had the largest share of the trade. Jute sacks are largely imported, mostly from Great Britain, though of late the Germans have attempted to compete in this branch, and French manufacturers are also on the *qui vive*.

NEW MATERIALS IN BERLIN.—It is a proof, continues a correspondent, that the centre of fashionable gravity is passing from Paris to Berlin that one hears far more frequently here of new materials than in Paris. It is the business of Germany to turn out the new materials. France utilises or copies them. Among others are curled damask cashmere in black, blue, and brown, and Himalaya rayé, which is very suitable for quilting evening or spring mantles. Mousseline de laine, with a palm leaf pattern and cashmere effect, attracts great attention when combined with plush in suitable shades of colours. Feather trimmings appear in a variety of forms, and those with a chinchilla effect seem likely to play a considerable part in the fashions of next season. A striking effect is also produced by introducing chenille among the feathers, the principal colours being black, otter, and beaver, but always corresponding exactly to those of the feathers.

A NEW FIBRE IN MEXICO.—A German correspondent says that the enormous increase in the cultivation of "Hennequen," or Sisal hemp, may to some extent be estimated from the fact that the exportation of this fibre from the Harbour of Progreso amounted in 1880 to only 97,351 bales, valued at 1,805,848 pesos, in 1886 to 228,387 bales, worth 3,927,727 pesos, and in 1887 to 219,897 bales, valued at 6,012,877 pesos, the increase in value last year being very remarkable. The bulk of the exportation takes place to the United States by the steamers of the Alexander line. The cultivation of this valuable plant has contributed greatly to the prosperity of the State of Yucatan, and railways now cross the country in all directions in connection with the Hennequen farms. Other useful fibrous plants, such as Ixile and Zacaton, grow abundantly in various parts of Mexico, and the Mexican Agave and Yucca, which can almost dispense with rain, possesses also a strong fibre that would prove most valuable for many purposes, if a thoroughly effective decorticating machine had been invented, and this doubtless is only a question of time. In the valleys of the Southern Gulf States, the so called "Pita" grows wild and neglected, and its firm elastic fibres, which sometimes exceed nine feet in length, must some day play an important part in textile industries. This branch of Mexican agriculture seems assured of a prosperous future, and is already attracting the attention of foreign settlers.

COTTON GOODS AND MACHINERY IN ITALY.—A Roman correspondent says that the committee appointed by the Italian Government to consider the question of raising the import duty on machinery and cotton goods has published its report, and recommend the following modifications of the tariff:—An advance from 11 lire to 12 lire is proposed on pieces of machinery, though it is intended to tax them later on according to the material of which they are composed. It is, moreover, thought advisable to raise the duty from 30 lire to 32 lire on raw cotton yarn running from 10 metres to 20,000 metres per $\frac{1}{2}$ kilo, and from 36 to 40 lire per 100 kilos on yarns of 20,000 to 30,000 metres per $\frac{1}{2}$ kilo.

THE FRENCH HAVE AN EYE ON THE BARCELONA EXHIBITION.—The manufacturers of Sedan will be worthily represented in the Barcelona Exhibition, although many firms have reserved their best patterns for the Paris Exhibition, which is to be opened in 1889. The variety in the designs and materials is said to be marvellous, especially as regards men's clothing, comprising diagonals, doeskins, moscowas, black cloth of all grades, moleskins for winter wear, and merinoes. The samples of materials for ladies' dresses embrace Cheviots, Astrachans, Albions, which are said to rival the best British products, zibelines, cashmeres, and tricot goods of all kinds. The collection of samples intended for Barcelona will afford an excellent idea of the manufactures of Sedan which, however, will no doubt be even more perfectly represented in the Paris Exhibition. A special show-case contains, as it were, the history of this industry, namely, the various kinds of wool employed in Sedan—Silesian, Hungarian, and Australian, scoured and unscoured, samples of nolls, cashmere, and Vicuna, then yards of every description, carded and combed, showing the various stages through which the wool passes in the course of manufacture. Photographs are not wanting to illustrate the diversified and sometimes complicated machinery employed, such as spinning frames, looms, &c., and serve to render the various processes thoroughly intelligible even to the uninitiated.

IMITATIVE SPANIARDS AND BRITISH GOODS.—Mr. Consul Woolridge, of Barcelona, says British manufacturers "must expect imitation and competition" from the Spanish manufacturers, "but we have something worse than that now; they do not imitate for the sake of imitating English goods, for their colours, designs, &c., are produced from the brain and the natural taste of the people; but they put up the native wares for sale as English, and no patents or trade marks will protect our goods, or prevent the Catalans from imposing their wares as English make and English production."

The examinations for the Yorkshire College Clothworkers' Textile Scholarships were held on Wednesday and Thursday, April 25th and 26th. The number of candidates considerably exceeded that of previous years, being between 40 and 50. The following have been nominated scholars for Session 1888-9:—*Day scholars*—J. H. Hartley, Wakefield; Elliot Hinchliffe, Leeds; T. H. Newsome, Dewsbury; (equal) A. T. West, Keighley, and A. Davis, Leeds. *Third year evening scholars*—W. F. Hird, Apperley Bridge; Joe Binns, Batley; Percy Coombs, Bramley. *Second year evening scholars*—John William Dennison, Morley; J. M. Bell, Dewsbury; W. H. Cluderay, Leeds.



ODDS AND ENDS.

Sir George Verden has been appointed British Commissioner for the forthcoming Melbourne Centennial Exhibition.

In the *Moniteur Officiel du Commerce*, the final list of subscribers to the guarantee fund of the Paris Exhibition, 1889, has appeared, showing a total guarantee of 23,124,000 francs or £924,960 sterling. Guarantees have been given by all classes, and corporate bodies, such as industrial companies and mining companies, are prominent by their promises of one thousand pounds upwards and downwards.

A permanent exposition company was recently incorporated under the title of the International Exposition Company of Chicago. The incorporators intend to have an exhibition of the products, manufactures, machinery, mechanical devices, resources, soils, minerals, works of art, domestic animals, merchandise, statistics, matters of education and scientific interest, curiosities, and other matters of the several States and Territories and Foreign countries. As there is nothing of the kind in the world at present, the company thought it would be a good thing, as it would be of interest to all the States and Territories, giving them an opportunity of placing upon exhibition their products of whatever character they might be, thus serving to advertise, and to attract the attention of emigrants and others who could be reached in no other way. The company consider that there is no way of impressing upon the public the value of goods so well as by showing them, and that is what the perpetual exhibition is intended to do, not only for manufacturers, but for the States and nature as well. The site for this proposed building has not yet been selected, but the incorporators say it will be in the central part of the city. The capital stock of the company is \$500,000.

Carding Engines and their Clothing.

A Lecture given at East Crompton,

BY MR. JNO. BUTTERWORTH, F.R.M.S.

(Concluded from page 40).

"We must now draw your attention to

SEVERAL OTHER FORMS OF CARD TEETH.

No. 6 represents the flat wire tooth. The wire was originally made flat throughout, like the bit of fillet accompanying the tooth, but now I believe the teeth are only flattened above the bend, as shown by the sample. No. 7 represents the double convex wire, and No. 8 represents Walton's angular wire. All these different forms of wire suffer from a side weakness when grinding—the flat and double convex especially so—but the angular wire is more firm, and when made in steel, is considerably firmer than ordinary round iron wire. The object aimed at in these different forms of teeth is to produce a wire that would readily grind up to a smooth, keen point, and I believe that angular wire, so far, has borne very good tests. No. 9 sample represents what a true needle point ought to be. If ever cards are made with that form of point, you can see that they would tell a different tale to the present imitations, and Ashworth's last attempt is a very near approach to a true needle point, but, having to form it by side grinding, as he states, I fear it will be left rough, like all other attempts. A true needle point can never be formed with the present modes of grinding, because it must be smooth and round quite up to the point. Absolute smoothness is essential in all card wire, if cards must clear well with the enormous weight that is now being passed through them, and No. 10 sample gives you an idea of the smoothness that all such wire ought to have. Nos. 11, 12, and 13 are the last three forms of card teeth we have to notice. They represent the form of point that has had to do duty for something like a century. I would give it up for something better, but not because it is old. I respect the old tooth for what it has done. I wish to say a few words as to the merits of

PLAIN, RIBBED, OR TWILLED FILLETS,

for I suppose we shall be told that sheets are out of date, so little is seen or heard of them. Whoever had to do with laying down the original plan of clothing cards deserves credit for a good share of common sense. They stuck to sheets set plain for clothing every part of the card, and I feel sure that they were only driven to the use of fillets when it became essential to draw a continuous web from the doffer, so as to make a sliver. I have no doubt there are gentlemen present who know that I have stuck hard and fast for sheets as covering for cylinders and tumblers, and, though I have hesitated to put them on the cylinders of revolving flat cards, it is not that I have lost faith in them. A plain set card is made on correct principles for clearing quickly, especially so with sheets, and I always consider there is a greater suppleness in a plain back card than there is in a rib back, which seems to be caused by the teeth being more crowded in the foundation in the case of the rib back than they are in the plain back. But you will perhaps say, "What about the loss of wire through such large spaces between the sheets?" Ah! well; you have raised the ass's bridge that hundreds have raised before anent this matter—What must we say? Can you do without space between your flats either in Welman or revolving flat cards? If so, where will the heel and toe of your flats be? I think you have robbed the revolving flat enough already of those spaces. I think, if you will investigate the matter, you will find that the spaces of a sheeted cylinder do ample service to compensate for any loss of wire, but, *apropos* of this matter, one authority makes a calculation giving us about 14 fibres to the square inch in a card carding 600 to 700 lbs. per week, so that we can afford to lose a few points. As to the extra current of air from sheets compared to fillets, I should say that the almost perfect control we now have over these air currents, by the present system of blocking, should scarcely need a pause. I am pleased to see that some attempt is now being made in the nailing of fillets to get back to the position the wire holds in a sheet. I refer to

NAILING THE FILLETS ON IN RINGS.

It does away with tail ends, giving a better selvaige to the web. Of course, a break is made at every piecing, but as these are in a line across the cylinder, a block of wood or some other material is inserted that will grind away as the card wears down. As to ribbed

or twilled fillets, ribbed is mostly chosen for rollers and clearers, because of the greater firmness given by the mode of setting. Twilled fillet, however, clears better and sooner in grinding on account of the absence of one or two rows of points at each side of the fillet. Of course, there is more space between the teeth, and the short fibre leaves the card quickly at this point. I am reminded here about the great rage there is now to have all the carding points we can get stuck in a card. To such an extent has this been carried, that we get a card so densely crowded with points that many impinge one against another. "If," as the authority I have quoted states, "we have four times as many points in the cylinder as we have fibres to be laid hold of, and eight times as many in the flats, 44 at work," surely there is no need of all this crowding of points. This, I think, will furnish another reason why cards clear so badly. Card wire is intended to perform the same office that a comb does on a combing machine, but if the points are overcrowded, how is it possible to give a combing action to the fibre? 120's and 180's in the counts of cards are as commonly spoken of now as 90's and 100's used to be. I grant that we require an excess of points over the number of fibres, but when it is made out that we have some 600 points to every 14 fibres, it would look as if we had gone far enough in this direction. I fear we have not much time to go into the subject of

GRINDING CARDS.

You know my views on side grinding, or that mode in which a feather edged emery disc penetrates between the teeth half way down to the heel. The object aimed at is right, but the means adopted to accomplish it are wrong. The plan of slow grinding is becoming, and will become, more common. To give our young friends a better idea of what I mean by slow grinding, I will say that it means running the card very slowly, while you run the emery roller very quickly. The opposite, and common, mode of grinding is to run the card at a far greater surface speed than your emery roller. To enable you to form an estimate as to which is the best mode, I will put it in this way:—If you bring two revolving surfaces into contact with each other, that which makes the greatest number of feet per minute will tend to wear the other away, so that, in case of a cylinder or doffer making more feet per minute than the emery roller that is supposed to be grinding them, the tendency is to grind only the tip of the teeth, and in this way produce a flat point, which we know is produced, but, by slow grinding, you get more to the back of the tooth, and produce a nearer approach to a diamond point. The principal argument raised against slow grinding (which is groundless under proper management) is that it heats and takes the temper out of wire. If so, what about side grinding, where the discs are forced down between the teeth? Is there no heating there? I am in favour of slow grinding, using Dronsfield's corrugated emery roller. It will get as far down the sides of the teeth as it is wise to grind them, and it can be covered with fine emery, yet answer all the purposes of coarse emery. I do not believe in very coarse emery for grinding cards, and I am reminded here of what an old friend, who has worn his head grey studying these matters, said to me one day when we had this subject up. He said:—"A chap does not often take his razor to the slop-stone to rub a shaving edge on it." I am afraid my paper has been somewhat disjointed, but I have done my best to make myself as intelligible as possible. It is a subject that others are investigating. I suppose we are all seeking after truth, and all that we ask is for "more light."

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, April 28th, was 343. The number in the corresponding four weeks of last year was 388, showing a decrease of 45, being a net decrease in 1888, to date, of 54. In addition to these gazetted failures, there were 272 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks, making a total in 1888, to date, of 1,044. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, April 28th, was 942. The number in the corresponding four weeks of last year was 1,021, showing a decrease of 79, being a net decrease in 1888, to date, of 195. The number published in Ireland for the same four weeks was 41. The number in the corresponding four weeks of last year was 52, showing a decrease of 11, being a net decrease in 1888, to date, of 80.

The Journal of Fabrics

AND

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INTERNATIONAL EXHIBITION, GLASGOW: Messrs. Hutchinson, Holmworth and Co. Limited, of Dobrosza, near Oldham .. 68	Original Design for a Table Cover.
Messrs. Watson, Laidlaw and Co., Glasgow .. 68	Messrs. Hutchinson and Knowles' Patent (Open Shed Loom).
	St. gran Automatic Steam Engine.
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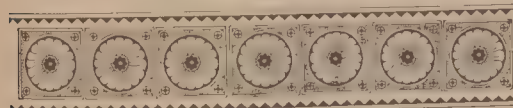
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Wool Impurities and their Extraction.

By "TEXTILE."

From the circumstances under which wool grows, and also from the physical characteristics of both individual fibres and masses of the same, it will at once be evident to the inquiring mind that impurities in wool must be many and varied in character. These impurities may be divided into two classes—1st, natural impurities, viz.:—impurities which do not appear at first as essential, but which will be shown further on to be necessary for the production of good sound wool; 2nd, the un-natural impurities, viz.:—impurities which are present in the fleece through the habit of the sheep, and which will vary both in kind and quantity, according to the district in which the wool is grown. As the character and, consequently, the manner of extraction of these two classes vary greatly, it will be necessary to treat of each separately. (1st) Natural impurities.—If wool be examined in the lock and then in the thread, or, better still, in white cloth (as the oil necessary for good manipulation is not in white cloth) till the wool reaches the cloth stage) it will generally be seen that a large amount of matter other than wool is present. Commercially, this matter is all termed wool yolk, but scientists, Chevreul for example, prefer to term only certain portions of this yolk. Experience teaches that wools from countries having hot climates have a much larger per centage

of yolk than wools from other climates. This is readily accounted for, as yolk to no small extent is the effect of perspiration. The presence of a large amount of yolk indicates good wool, and *vice versa*; further, the best wool is found on that part of the sheep which has the most plentiful supply of yolk. This knowledge is, perhaps, more serviceable to the farmer than to the manufacturer, as many wools come into the market partially scoured, and it would hardly be wise to judge wool by the amount of yolk when it may be so readily tested by handle, strength, &c.; but the sheep farmer has taken and is taking advantage of this knowledge, for it is found that on poor, cold soils, which, as stated before, give only a small quantity of wool yolk, farmers are in the habit of smearing the sheep with substances which partake more or less of the character of the true wool yolk, the effect of wool yolk being evidently to strengthen and improve the wool. The following is the analysis of a sample of wool:—

Earthy substances	- 26.06	Earthy matter fixed by grease	1.40
Suint or yolk	- 32.74	Clean wool	- 31.23
Fatty matter	- 8.57		100.00

This gives only about a third of pure wool, but all manufacturers know that few wools loose anything like that, and yet most analyses of wool will be found to come very near the above, so the conclusion comes to must be that in the chemical analysis something is extracted, which is not extracted in practice. This, with the knowledge that a good wool and consequently one containing a considerable amount of yolk is generally selected, no doubt does account for the seeming disparity. The reasons why in practice all the yolk is not extracted are—(1st) that it is known to those who have to manipulate wool that, do what you will with it, it still retains its "nature" as it is termed, in other words, while there is a yolk on the outside of the fibre which is not difficult to remove, there is a substance pervading the interior of the fibre of an oily character, which is exceedingly difficult to remove, which in fact may, in a certain sense, be said to form part of the fibre. Nor is it deemed advisable to remove this completely, unless the wool is to be dyed some bright colour, when it certainly is advisable to extract as much as possible of it, and even then some is nearly sure to be left. The only way which seems at all likely to extract all this oil is by means of the air-pump, this method having been tried on a small scale for both scouring and dyeing, the operation being carried on in a vacuum. The other reason why all the yolk is not extracted in practice may be said to depend on the fact that it is hardly possible to obtain an agent which will act on all the substances in yolk, such as the fats, minerals, &c. Thus in the chemical analysis, the fibre is treated with several scouring agents, one for extracting the oily substances, another the mineral, and so on, thus a much more perfect result is obtained, but at the same time such results cannot be made the basis of practical calculation. A wool that loses half its weight is considered to lose a large amount in practice, while wools which come over here washed only lose from about 2 to 4 lbs. in 16. It may not be out of place to consider here the reasons for washing or not washing wool before it is exported from the country in which it is grown. When the weight of the yolk, &c., and the cost of the carriage for wool between here and Australia, for instance, are considered, it is at once evident that to wash the wool before exportation means the saving of somewhere about half the expense of the carriage, which certainly is worth saving. In addition to this, wool which has been washed previous to exportation is not liable to be affected in colour by the oils, &c., present in the yolk, while unwashed wool is liable to this, but, at the same time, these oils tend to keep the wools soft and plastic. The principal disadvantage of washing before exportation is that the yolk is lost, as the wool is only washed when some river or stream is near, which renders this operation easy, the sheep being washed in the running stream. This is undoubtedly a loss to the farmer, as the yolk possesses valuable manurial properties. This state of things has of late received more attention, and companies have been formed to extract the yolk before exportation, and to convert it into its most useful form. The manufacturer, perhaps, is not so much affected as the farmer, for if the wool is sent over unwashed, though the yolk is extracted and utilised, there is the extra carriage to pay. The amount of scour used need hardly be taken into account, as the

PATENTS.

Applications for Letters Patent.

Apparatus and means for cleaning vegetable fibre. A. Figge, London.	31st Mar.	4,887
Arrangement and construction of singeing machines for textile fabrics. G. C. Douglas, Dundee.	16th April	5,592
Automatic letting-off and taking-up motion for looms. J. Stanley and J. Vickerman, Leeds.	20th April	5,882
Boiling or bleaching and washing textile fabrics and yarn, and apparatus therefor. A. McNab, Glasgow.	14th April	5,550
Belting. P. Jensen, London.	17th April	5,715
Batting or beating pile fabrics. T. Norton and G. T. Hellewell, Leeds.	19th April	5,816
Buckle for joining the ends of driving tapes, &c. W. Turner, Halifax.	24th April	6,073
Carrying the bobbins of traverse warps in Milanese and other machines. G. and W. Beardsley, and R. Hunt, London.	3rd April	4,963
Constructing pattern designs suitable for textiles. A. Hind, Bradford.	9th April	5,226
Cutting and making conical paper tubes. J. Evans, Bradford.	10th April	5,287
Carding engines. J. W. Shepherd, W. Ayrton, and T. S. Whitworth, Manchester.	11th April	5,395
Cutting or dividing plush, &c., woven by the double cloth method. H. and A. F. Scott, Bradford.	17th April	5,648
Clipping lace nets. A. C. and H. Gill, Nottingham.	24th April	6,052
Carriages for lace machines. J. Jardine, Nottingham.	26th April	6,165
Damping woven fabrics, &c. E. Breadner, London.	6th April	5,135
Driving spindles of spinning and twisting machines. Leedham Binns, London.	10th April	5,335
Drawing a thread or yarn from woven cloth, &c., for testing it. M. Mouradian, Manchester.	20th April	5,896
Decorating, breaking, scutching, and dressing Chinagrass, &c., applicable to other purposes. T. C. Baraclough, London.	21st April	5,966
Dyeing cotton. H. Gross, London.	23rd April	6,029
Dispensing with check straps of shuttle boxes of looms. J. R. Kemp, P. Houghton, and J. Leach, Halifax.	25th April	6,114
Drop-box looms. W. H. Hacking, Manchester.	26th April	6,187
Figured fabrics. T. Taylor and J. Warburton, Manchester.	31st Mar.	4,861
Feeding slubbings or silvers of wool to carding engines. E. Priest, Halifax.	3rd April	4,938
Friction towels. F. S. Bellhouse, Manchester.	5th April	5,077
Fastener suitable for belts, &c. S. Brooks, Huddersfield.	9th April	5,217
Feeding apparatus for washing, soaping, dyeing, or otherwise treating woven fabrics. W. Birch, Manchester.	18th April	5,761
Faller operating mechanism of gill-boxes used in preparation of fibres. E. R. Merrill, Keighley.	21st April	5,930
Feed apparatus of carding engines. J. M. Hetherington, Manchester.	21st April	5,941
Finishing woven fabrics. J. Kirk and B. Lee, London.	23rd April	5,999
Glazing textile fabrics, &c. J. McNish, London.	4th April	5,032
Gig mills. J. C. Mewburn, London.	11th April	5,394
Hot pressing fabrics. F. Dehaitre, London.	14th April	5,563
Hydraulic apparatus for compressing and baling cotton, &c. P. Bonoillain and F. L. J. Greyon, London.	14th April	5,585
Humidifying the air in mills, &c. J. Hoyle, Manchester.	17th April	5,659
Heating the feed supply of boilers. J. Rankine, North Shields.	17th April	5,670
Healds and heald shafts for looms. J. Gaunt and M. Stansfield, Bradford.	26th April	6,166
Improvements in looms for textile fabrics, relating to checking the shuttle and picker. H. Helm and A. Bridge, Padham.	13th April	5,505
Jacquard machines. J. S. and S. Smith, Glasgow.	3rd April	4,925
Lubricators. J. T. Hailwood, Rochdale.	5th April	5,051
Looms. W. J. Thompson, London.	10th April	5,301
Looms for pile fabrics. J. P. Belicard, Manchester.	18th April	5,777
Looms for pile fabrics. M. Dickie, Manchester.	18th April	5,795
Lace machines. S. W. Widdowson and S. Truman, London.	20th April	5,907
Loose reed looms. C. Turner, Rawtenstall.	23rd April	5,997
Looms in which rising and falling shuttle boxes are employed. J. Cowburn and C. Peck, Manchester.	26th April	6,209
Making cards for carding fibrous materials. J. Moseley, London.	3rd April	4,956
Method of and apparatus for driving the spindles of machinery for spinning and twisting fibres. E. Shackleton, London.	17th April	5,691
Mode of, and means for, lubricating journals. M. Coulson and M. L. Mulholland, Stockton-on-Tees.	23rd April	6,007
Operating the shed in looms. B. Heppenstall, Halifax.	18th April	5,776

Power looms. J. Jucker, Manchester.	31st Mar.	4,850
Presses for wool, &c. J. P. Dowling, London.	3rd April	4,973
Printing fabrics. J. Knowles and J. Whittaker, Manchester.	7th April	5,163
Perforating jacquard cards and printing a register of the numbers and positions of the holes made in such cards. W. H. Beck, London.	7th April	5,190
Pointing the wires employed in the manufacture of card clothing. J. Butterworth, London.	11th April	5,380
Printing and dyeing cambric, &c. W. Green and J. Douglas, Belfast.	19th April	5,828
Reeling machines. T. Holt, Manchester.	31st Mar.	4,862
Raising and lowering the shuttle box of looms. C. Bedford, Halifax.	16th April	5,502
Rolling machines for stripping cloth off cropping machines. W. Scott, Dundee.	21st April	5,948
Removing the list of fibre from cotton seed and for like purposes. M. Crawford, Liverpool.	21st April	5,954
Reeling yarns or threads. W. T. Stubbs and J. Heaton, Manchester.	21st April	5,960
Self-acting mules. J. Clegg and J. Moorhouse, Manchester.	3rd April	4,919
Shuttle picking for looms by means of compressed air. J. F. Lee and G. Croll, Dundee.	3rd April	4,933
Subjecting textile materials to the action of fluids for washing, dyeing, bleaching, &c. C. A. G. Schmidt, London.	4th April	5,035
Spindles and flyers used in twisting and winding yarns, &c. P. F. Lynde, Manchester.	5th April	5,060
Scouring, &c., fabrics. S. Crowther, Halifax.	6th April	5,115
Securing bobbins upon the pegs or spindles of shuttles of looms. G. Slingsby, London.	6th April	5,136
Spools or bobbins. The Sächsische Spireleufabrik and O. Ginzul, London.	7th April	5,193
Stopping steam and other engines from different parts of a building. C. Glade, London.	9th April	5,257
Spinning, twisting, and hanking. W. Taylor, Glasgow.	10th April	5,343
Separating and cleaning cotton, &c. W. Noton, Oldham.	14th April	5,538
Springs for organ handles used in loose reed looms. M. Ainsworth and J. Catlow, London.	16th April	5,614
Securing the correct length or parts of length of fabric made on circular run-up knitting machines. T. Dudley and A. King, Nottingham.	18th April	5,773
Stop motion, picker check and apparatus for guiding and actuating healds. J. Holt, J. Spencer and W. Oldfield, London.	19th April	5,826
Spindles for spinning machines. J. and W. Hogg, London.	17th April	5,736
Spinning or twisting. J. Majerispn, London.	24th April	6,060
Sizing, warping, and beaming. J. Vickerman, Leeds.	24th April	6,069
Shed in looms for plain fabrics. H. Whitwam, Halifax.	24th April	6,074
Spinning and doubling mules. J. Hodgkinson, S. Bamford, and J. Ranson, London.	25th April	6,147
Shedding and taking-up motions of looms. E. Hollingworth, Halifax.	26th April	6,181
Testing top rollers of spinning, &c., machines. J. Jucker, Manchester.	4th April	5,007
Treating textile fabrics with steam. C. D. Abel, London.	10th April	5,338
Testing and indicating the strength of yarn. H. Dickinson, Halifax.	18th April	5,769
Twisting or doubling yarns or threads. E. R. Merrill, Keighley.	20th April	5,883
Twist lace machines. B. Hallatt, London.	23rd April	6,032
Un gumming reeds and other fibres. J. Papeux, Hitchin.	3rd April	4,968
Woven fabrics and mechanism in connection with looms. S. Dobroff, G. Nabhoby, and S. Thompson, London.	31st Mar.	4,894
Working dabbing brushes of combing machines. F. Unwin, London.	7th April	5,202
Working card cylinders of loom dobbies. J. F. Kirk and E. Brook, London.	9th April	5,239
Washing or cleansing and finishing engine waste or other like soiled oily yarns, cloths, or other fabrics and apparatus for collecting the same. J. H. Williams and M. W. Hydes, Liverpool.	9th April	5,256
Warp machines. A. Padgett, Loughborough.	10th April	5,277
Wool combing machines. H. Wagman, London.	11th April	5,406

Patents Sealed.

1,350	1,526	1,810	2,206	2,207	2,208	2,325	2,583
4,117	4,419	4,454	4,599	4,547	4,709	5,150	5,672
15,265	3,665	4,985	4,337	4,745	4,880	5,113	5,205
5,668	5,676	10,188	11,327	14,088	14,158	14,909	14,922
15,680	18,016	1,915	4,579	4,972	5,148	5,160	5,220
15,301	5,416	5,447	14,892	402	461	2,423	3,734
4,243	4,344	4,892	4,941	5,336	5,407	5,824	7,301
13,445							

not familiar with the general structure of cloths produced by cross-weaving, we may briefly indicate how the interlacing of the crossing threads is accomplished. Let it, at the outset, be understood that in textures arranged on this system any thread, or set of threads, may be made to travel over other threads, and form either a zig-zag, diamond, lozenge, or any other simple figure; or, the ends may be wrapt round adjacent threads, forming a transparent, yet a firm, elastic texture. Each doubling, *i.e.* each twisting thread is drawn through two healds, the back shaft, when lifted, elevates the end on the right side of the threads, round which it is intended to pass, while the front shaft, when raised, lifts it on the left side, or *vice versa*. Bearing this important principle of cross-weaving in mind, let us analyse the fabric of which a sketch is given in Fig. 1. The cloth before us is as compact in composition as an ordinary texture. In this particular, it possesses a considerable advantage over fabrics of a gauze or leno type, which are extremely flimsy in structure, and only suitable for the lightest robes. The leno or doupe ends, C and D, operate quite independently of the ground threads. The latter work tabby, forming a firm, sound, foundation, to which the crossing threads are attached. As to the pattern, it is due (1) to a diversity of colouring; (2) to the diamond

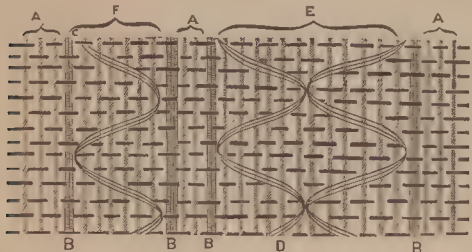


Fig. 1

figure produced by threads D; and (3) to the zig-zag formed by threads C. Turning attention first to the colouring, we have the ground of the fabric a solid brown, on which three other stripes are obtained by threads of white, pink, and olive. Cotton is the principal material used in making the cloth, forming the ground thread in the warp, and being employed for weft. To enhance the effect due to the crossing threads, the ends B, C and D are threefold, and not cotton, but worsted, but still cotton could be used with good effect. The ends B form white lines down each side of stripes E and F. Though working plain like the ground threads, they give clear, definite, lines of white, their three-ply character causing them to appear prominent in the pattern. Ends D are of a bright olive shade, and pass from the centre to the sides of band E. They are secured to the foundation of the texture by two weft picks floating over them at the points where they meet to form the diamond figure, and also at the edges. They float over the

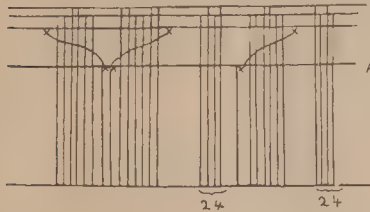


Fig. 3.

entire series of ground threads and picks of the stripe. In the reed, seven threads are slaved together in sections E and F. This is absolutely necessary on account of the threefold yarns C and D traversing over six ends, and it is a rule in leno weaving that, whatever number of threads are passed over by the doupe yarns, they must be entered into one split in the reed. In order that the doubling threads may be spread out as much as possible, and have the ribbon-like appearance seen in the sketch, they should, though actuated as one yarn, be drawn through separate mails or healds, in other terms, each single end of threads D and C must have its own heald. Threads C, which form the zig-zag stripe, are bright pink. They have precisely the same movements as the doupe ends in part E, being controlled by the same shafts. It should be observed that in the actual fabric the ground threads in parts E and F work dent. The object of this arrangement is to facilitate weaving. If provision were not thus made for easy wefting where the threads are crowded seven in a split, comfortable and accurate shedding in these parts of the warp would be impracticable. In Fig. 2, the heading draft is supplied, and in Fig. 3, the design and the peg plan. It will be noticed on consulting the draft that the doubling ends are first drawn through shaft B, and then through shaft A. When the former is depressed, the threads C and D are tied on the right side of the stripe, but when the latter, on the left. A very neat modification of this style may be made by enlarging the stripes of plain, and arranging the ground of the cloth in mellow-toned checks of mid-blue and brown; or, if three stripes were formed like F, and then bands of plain part, E, and plain again, a good pattern would result. In fact, the design may be modified in several ways, and turned to considerable account. The pattern taken as a whole would be very effective if worked in cotton alone, or with certain of the yarns in worsted, mohair, or silk.

Classification of Articles in Customs Tariff :— OF CHINA.

NOTE.—*Hailwan Tael* = 16 *Mace* = 100 *Candareens* = 1,000
Cash = 6s. 8d. (nominal value). *Catty* = 1½ lbs. *avoirdupois*.
Chang = 141 inches.

The *Board of Trade Journal* says:—The following is a statement of the rates of Customs duties now levied by the Customs authorities of China. This statement is taken from a recent publication of the Statistical Department of the Inspector-General of the Chinese Imperial Maritime Customs. The Customs Tariff is prefaced by the following explanatory remarks:—“The import and export divisions of the original tariff of 1858, and the lists of duty free, of exceptional, and of contraband goods, based on Rules 2, 3, and 5 of the ‘Rules appended to the Tariff,’ have been amalgamated, and arranged alphabetically. The decisions of the Chinese Government affecting the original tariff which have come into operation since it was first published have been entered in their proper order. Of the decisions given since the issue of the original tariff, the present tariff comprises only those which affect customs practice at all the treaty ports, local rulings not having been included. Customs permits are necessary for the shipment and discharge of whatever is not allowed to accompany passengers as personal baggage, *e.g.*, duty-free goods, treasure, parcels, &c., and all such articles must be entered on the manifest of the vessel concerned.”

CUSTOMS TARIFF.

Classification.	Rates of Duty.
	t.m.c.c.
Clothing, cotton - - - - -	100 catties 1.5.0.0
Do. foreign - - - - -	Free.
Including ready-made clothing of all kinds for head, person, or foot, or first materials for foreign clothing, male and female (if imported in reasonable quantities by foreign retail dealers, tailors, and milliners, for foreign use); hosiery, haberdashery, and millinery. [Excluding umbrellas, cotton handkerchiefs, silk ribbons, silk thread, silk shawls, silk scarfs, silk tassels, silk caps, Chinese felt caps.]	
Do. silk - - - - -	100 catties 10.0.0.0
Cotton piece goods:—	
Grey, white, plain and twilled:—	
Exceeding 34 ins. wide and not exceeding 40 yds. long	Piece 0.0.8.0
Including T-cloths 36 ins. wide and 24 yds. long	
Exceeding 34 ins. wide and not exceeding 40 yds. long	{ every } 0.0.2.0
long	{ 10 yds. }
Drills and jeans:—	
Not exceeding 30 ins. wide, and not exceeding 40 yds. long	Piece 0.1.0.0
Not exceeding 30 ins. wide and not exceeding 30 yds. long	” 0.0.7.5
T-Cloths:—	
Not exceeding 34 ins. wide and not exceeding 48 yds. long	” 0.0.8.0
Not exceeding 34 ins. wide and not exceeding 24 yds. long	” 0.0.4.0
Dyed, figured and plain, not exceeding 36 ins. wide and not exceeding 40 yds. long	” 0.1.5.0
Excluding foreign cottons dyed in China. See Nankeen and native cotton cloth.	
Fancy, white brocades and white spotted shirtings, not exceeding 36 ins. wide and not exceeding 40 yds. long	” 0.1.0.0
Printed, chintzes and furnitures, not exceeding 31 ins. wide and not exceeding 80 yds. long	” 0.0.7.0
Cambrics:—	
Not exceeding 46 ins. wide and not exceeding 24 yds. long	” 0.0.7.0
Not exceeding 46 ins. wide and not exceeding 12 yds. long	” 0.0.3.5
Muslins:—	
Not exceeding 46 ins. wide and not exceeding 24 yds. long	” 0.0.7.5
Not exceeding 46 ins. wide and not exceeding 12 yds. long	” 0.0.3.5
Damasks, not exceeding 36 ins. wide and not exceeding 40 yds. long	” 0.2.0.0
Dimities or quiltings, not exceeding 40 ins. wide and not exceeding 12 yds. long	” 0.0.6.5

yolk itself possesses good scouring properties; this obviates the necessity of any extra scouring agent being used. There is also another advantage of washing before exportation, and that is that the wool, being free from most impurities, is more readily judged, and this most certainly is an advantage, as those who have to select wool know how difficult it is to judge of the waste likely to occur. The best way, when practicable, to test the quantity of foreign matter present in wool is to scour a small weighed quantity, if it is intended to scour the whole, and then weigh, when the loss is at once ascertained; further, if the loss on the whole batch be required, the following is the formula:—"As the original weight of the quantity scoured is to the weight of the same after scouring, so is the weight of the unscoured batch to the weight of clean wool." Or, if the cost of a wool when scoured is required, the price in the grease only being known, then proceed as follows:—"As the weight of the scoured wool is to the weight of the same before scouring, so is the price per lb. of the greasy wool to the price per lb. of the scoured wool." The great scope there is for judgment in this matter is rendered apparent by the following list, which gives the variation of the several constituents of greasy wool:—

Moisture	-	-	4.24	per cent.
Yolk	-	-	12.47	"
Wool fibre	-	-	15.72	"
Dirt	-	-	3.24	"

In the previous analysis of greasy wool, the water was driven off before analysis, but from the above it will be seen that it is not an unimportant constituent. The quantity of water present varies according to temperature, the amount which should naturally be present under ordinary conditions should be about 18 per cent. That wool does contain moisture naturally is readily gathered from the fact that, after wool has been dried after scouring, &c., it will in a day or so gain perceptibly in weight. It has also been found that the presence of water affects the strength of the fibre, which is another proof that water is a natural constituent of wool. Before passing on to consider the scouring of wool, it will, perhaps, be as well to mention a more useful division of wool yolk, viz.:—wool fat, wool perspiration, dirt, and moisture. Wool fat is soluble in ether, and is that portion of wool yolk which is most difficult to remove from the fibre. It is the wool perspiration, and, no doubt, a fair proportion of dirt, which, from being soluble in water, is removed in "sheep washing," and as this contains large quantities of potash, as remarked before, a great loss of very useful material to the farmer is the result. Having dealt with the principal natural impurity—wool yolk, under various aspects, it is now necessary to consider the methods and agents of extraction employed. The reasons for scouring are, first, to bring the wool into a workable condition; second, to obtain a good colour; third, to render the fibre, into which the wool is made, soft and mellow. A brief glance at the results of bad scouring (mechanically and chemically), which will also lead on to the first object, will suffice to show how important it is that this operation should be well performed, and will also prove how necessary it is that "little matters" should be well attended to. The first object, that of bringing wool into a workable condition, has a greater scope than will appear at first sight. Of course, the primary object is to extract the yolk, &c., which would otherwise prevent the wool being carded well, but here we come upon another phase in its career; when the oils, &c., which pervade the wool fibre are extracted, they immediately make way for its physical characteristic to be felt, and this characteristic is so strong in some wools that it almost prevents efficient scouring. This matter, however, has attracted the attention of textile machinists, and we are now possessed of, perhaps, as perfect scouring machinery as we can expect in relation to the physical agitation of the bath, and obtaining a good scour. The efficient extraction of the yolk is most important, especially if the wool is for dyeing, for if any yolk, &c., be left in the wool, the result will be irregular, blotchy colour; and again, if the wool is to be extracted, a sticky compound will be found on the fibre, which is caused by the action of the sulphuric acid on the fats, &c. This will be found exceedingly troublesome to remove, and as it will clog up the serrations of the fibres, it will prevent the wool from felting, and thus deprive it of the privilege of acting on the proverb—"In

unity is strength." With regard to the second condition, viz., colour, perhaps the wool farmer has that more under control than the manufacturer, for, as remarked before, though wool yolk acts beneficially in keeping wool soft, &c., it also causes the wool to degenerate in colour, thus, no doubt, the wool washers determine, to no small extent, whether wool shall be used for white fabrics or not, for, while many wools come into the market washed, a great difference will be noticed between them, some being nearly white, while some still contain no inconsiderable amount of yolk, and for white cloths it is, of course, advisable to buy the whitest, still the fact must not be lost sight of that too strong scour and too hot water will give a yellow tinge to the whitest wool, and even dissolve the fibre to a certain extent, thus neutralising once and for ever the good effect ensuing from the care of the manipulators of the wool in the previous processes. With regard to the third reason for scouring, viz., to obtain a soft, mellow fabric, this, and indeed colour also, may be affected, not only here but in some of the subsequent processes, still this is no reason why every endeavour should not be made to forward the wished for result in this as in all the following manipulations, and, if this condition is not complied with, good results cannot possibly be obtained. Harshness of handle may be due to too great heat in scouring, too strong scouring solution, or, if extracted, to the sulphuric acid employed, or to subjecting the wool to too great a heat in drying it. These examples all tend to show how important and necessary it is that the scouring of wool should be well understood and also well performed.

(To be continued).

3 Sample of Cross-Weaving.

By "MÉTIER."

Practical technical knowledge is of the first importance in designing for woven fabrics. If the principles of weaving are to be intelligibly understood, they must be experimentally investigated. Just as the science of chemistry or of physics can only be advantageously studied by making actual experiments which demonstrate the constitution of matter, and the laws which govern the phenomena of the natural world, so the art of weaving requires to be considered in the light of what the loom can reveal. A theoretical synthesis is useful so far as it indicates the lines on which effects have been obtained, but it is the experimentalist, he who by practice has mastered the mysteries of the craft, and whose knowledge extends to the numerous systems of intertexture, that introduces to the notice of the trade novelties in cloth structure and design. Purely ornamental or decorative design is entirely distinct from the patterns figuring the vast majority of textiles. There is, though perhaps it has not yet been clearly defined, and, as a consequence, is not recognised as design by some artistic crafts men, a species of ornamentation characteristic of woven fabrics alone. As such it deserves to be treated as an independent study. Its capabilities, its combinations and results, not to name the part it plays in furthering the development of the entire textile industry, are all factors which ought to obtain for it special consideration. It is patent to the whole manufacturing community that many of the richest and most appreciated specimens of the weaver's art do not derive their beauty of ornamentation from an ingenious union of geometrical lines, from an appropriate adaptation of floral forms, or from a novel and pleasing arrangement and distribution of divers objects, but from a new principle of intertexture, producing a fabric remarkable for its neatness of appearance, novelty of structure, and simplicity of decoration. Textile specialities—speaking now of those intended for apparel—are invariably the outcome of the discovery of a new principle of intertexture, or of a fresh combination of crossings previously appropriated. When we approach the subject of design in goods manufactured for decorative purposes, such as carpets, tapestries, and damasks, then ornament undoubtedly results from the employment or modification of those forms common to all classes of elaborate design. Even as, in the former description of design, experimental knowledge of the laws and principles of weaving is the desideratum, so here it may be granted that skill in the manipulation of the brush and pencil, and in the distribution and origination of figure—in a word, trained draughtsmanship—lies at the very basis of successful work. We are immediately concerned with what may be developed in the way of design in woven textures by modifying known, or inventing new, systems of intercrossing. Here we have an all but unlimited field for experiment and investigation. All cloths, strictly speaking, come within three categories. First, those in which the threads of the warp are parallel to each other and also the picks of the weft, as in ordinary worsted, woollen, and cotton fabrics; second, those in which one series of the warp threads are crossed over or twisted round an adjacent series, while the picks of the weft are utilised in securing and maintaining the inter-crossings, as in gauze and leno textures; and third, those cloths in which some of the warp or the weft threads are drawn into loops (to form a loop pile) or cut (to form a cut pile) as in velvets, Astrachans, curls, corduroys, &c. In this paper, reference will be made to an interesting specimen belonging to the second class of textiles. It has recently been submitted to us for analysis, and illustrating, as it does, some of the special effects to be obtained by this principle of weaving, we have decided to describe its structure, accompanied by sketches, in detail. To make the following explanations of this fabric explicit to those who are

Cotton Goods for Singapore, China.

The following information respecting the trade of Singapore in textiles is extracted from a recent report by the French Consul-General at Singapore, published in the *Bulletin Consulaire-Francaise*:—"The most important of the imports into Singapore is that of tissues, cotton especially. In 1885, imports of tissues, known on the English markets under the name of piece goods, amounted to 10,452,817 dollars. Of this amount, England is represented by 8,355,186 dollars. France occupies the third rank among the countries sending tissues and cottons. It is noticeable that, in 1885, the amount of its trade was inferior to that of other years, figuring at 412,092 dollars against 728,211 dollars in 1884, and 712,762 dollars in 1883. This decrease of 316,000 dollars in the year 1884 was, however, notowing to the quality of French cottons, it was in consequence of the less prosperous conditions of trade in the Straits, and corresponded to the proportionate decline in the imports of a like character of other producing countries, as is shown by the following figures:—England (imports in 1885), 8,355,186 dollars and (in 1884) 7,959,895 dollars; France, 412,092 dollars and 728,211 dollars; Austria, 273,231 dollars and 212,790 dollars; Germany, 194,353 dollars and 216,456 dollars; Italy, 60,726 dollars and 46,729 dollars; Netherlands, 47,196 dollars and 113,161 dollars; and Belgium, 34,922 dollars and 44,271 dollars. If, on the contrary, some countries have not increased their imports, it is because in the least prosperous years the demand is for the cheapest kinds, and is addressed to those countries who make a speciality of them. Of the 10,452,815 dollars worth imported, there were re-exported 7,548,214 dollars in 1885. Of this amount, French Cochinchina absorbed a value of 1,858,685 dollars, consisting almost exclusively of plain cottons (1,558,667 dollars). The tissues and cottons imported into Singapore are the following:—Grey shirtings.—Packed in bales of from 50 to 100 pieces, wrapped at first in paper, then in oil cloth, and finally in very common strong oil-cloth; the whole is pressed with the hydraulic press, and bound with three or five hoops of iron. Supers,—packed in bales of 100 pieces, in the same way as grey shirtings. T-cloths,—in bales of 100 pieces; same packing as the preceding. White shirtings,—in cases of from 50 to 100 pieces. Cambrics,—in wooden cases lined with tin, each containing 10 corges or twenties, about 200 pieces. Each package of 10 pieces is wrapped in paper. The above articles, grey and white shirtings, supers, T-cloths, and cambrics, are generally dyed in blue or black by the Chinese, and are used for making their clothing. There is, therefore, a large market for those articles. Drills,—in bales of 30 pieces. American drills, which were formerly in demand in the market, have been beaten and replaced by English drills. Turkey-red cloth,—wrapped in paper and put in wooden boxes, sometimes lined with tin, with from 50 to 100 pieces per case. The lowest-priced qualities come chiefly from England; Switzerland provides the superior qualities. Turkey-red cloth must be a bright red, and have a very fast colour. Sarangs are essentially subject to the changes of fashion. It is, therefore, necessary to follow the latter and satisfy it by constantly having new designs. Batticks are now principally in demand; in order to sell them, they must correspond as much as possible with patterns furnished by the natives. From Switzerland comes the kain-siam, 32 inches by 89, which is sold at 8 piastres per corge, in cases of from 25 to 35 corges. It is also made 28 inches by 60, in cases of 50 corges, worth 4½ dollars per corge. Prints are imported in wooden cases, lined with tin, containing 100 pieces each. They are made from cambrics, shirtings, and muslins. The market for them is large, and their origin is almost entirely English. Consumers divide prints into two categories—steam prints and fast-dyed prints. The first kind loses its colour on first washing, and its price is low; it varies between 1 and 1-30 dollars per piece, 20 inches wide and 24 yards long. The second kind is now selling at from 1-35 dollars to 2-20 dollars per piece, of from 27 to 28 inches wide by 24 yards long, according to qualities and colours. Prints, like sarangs, change with the fashion; they are re-exported from Singapore to a large number of places which have each their particular taste. Here, again, manufacturers are obliged to produce new patterns, and they reap the advantage in fresh markets and enhanced prices. The French cotton industry is superior to the English as

regards perfection and variety. It is absolutely necessary for France to develop the export of her products, to consult the tastes of the population, and to submit to the usages and conditions of foreign markets, as do the English.

The Ramie Fibre.

The ramie plant, which is now generally recognised as a useful fibre producer, has puzzled many inventive minds as to the best means of decorticating it with a minimum of trouble, rendering the fibre marketable, within a reasonable price. Four machines have been used in Spain, the inventors in three instances being Frenchmen, and the other a Spaniard. A machine invented by M. Favier appears to be recognised as the most successful, but this is not purchasable, the inventor preferring to establish factories near the plantations, purchase the produce from the agriculturists, and decorticate and manufacture threads himself, as the Société de Ramie Française is doing at Torrella. A. M. Billon is credited with inventing a machine similar to that of M. Favier, but producing a higher amount of fibre per day, but neither is the Billon machine to be acquired for money. A. M. Kaulsk, of Paris, has also produced a small machine of 1 cubic metre in size, requiring a half-horse power to put it in motion, and which can be worked by the arm, a windmill, or by steam. It is portable, weighs 350 kilos, and its price is about £80. It has been known to produce 175 kilos. of commercial ramie in ribbons in ten hours. It is claimed from practical working experience that twenty Favier machines will earn a profit of nearly £12 per day, after defraying all expenses. These machines are said by Mr. Consul Wooldridge, of Barcelona, to have the advantage of extracting the fibre and making the threads clear of gum, for in the ramie which comes from China and India there is so much gum that it is most difficult to cleanse. The Barcelona inventor is a Don Demetrio Prieto, who is modifying certain of his machines for extracting fibre from textile plants, and many of these are in use with success in Mexico. Ramie is a powerful absorber of colours. To bring an equal weight of an equal intensity more colour is required than for cotton. Ramie, well handled, is susceptible of taking all colours in a most brilliant manner. It can even be given a finish as fine as that which can be given to silk. It is considered a great success in mixed velvets. Such goods are taking the place of *semili* silks, made of linen and silk. Coloured ramie has, however, one drawback—whenever it is shaken dust escapes. It is probable that some size will be found which will hold this without injuring the shape or the feel.

It is intended to hold an international competition of apparatus and methods for the preparation of ramie at Paris, on the 15th August next. The *Board of Trade Journal* gives the following particulars regarding this competition. Prizes will be given as follows:—(a) Machinery for preparing raw ramie with steam power—1st prize, 1000 fr.; 2nd prize, 700 fr. (b) Machinery for preparing dried ramie by steam power—1st prize, 1000 fr.; 2nd prize, 700 fr. (c) Machines for preparing ramie with horse-power, and suitable for colonial use—1st prize, 700 fr.; 2nd prize, 500 fr. (d) Hand machinery for preparing ramie, and suitable for colonial use—1st prize, 500 fr.; 2nd prize, 300 fr. (e) The best and most economical processes for changing strips of ramie into fibre ready for commercial and industrial purposes—1st prize, 1000 fr.; 2nd prize, 700 fr. A special jury appointed by the Minister of Agriculture will be entrusted with the examination of the machinery exhibited, and with the distribution, if thought proper, of the awards. It will appoint its president, reporter, and secretary. The jury will make such practical experiments and trials as it may deem necessary to ascertain the merits of each machine. These trials will be made on the farm of the Agricultural Institute, near Paris, where the stalks of ramie will be placed at the disposal of the jury. The exhibitors of machines selected by it will, besides, have to work their machines before the public for as long a period as the jury may decide. The jury, in deciding, will take into consideration the price of machine, facility of starting and working the machine, facility of repairing, durability of the machine, value of the machine from a mechanical point of view, value of the work of the machine, continuity, stoppages, &c., labour required to start the empty machine, amount of work required to put the machine in full working, useful product of the machine, number of persons required to feed and work the machine, cost of the machine for ten hours' work daily, hourly yield of the machine, yield of the machine per 1,000 kilos. of stalks, net cost of preparing 1,000 kilos. of stalks, net cost of 1,000 kilos. of fibre obtained, value of fibre on leaving the machine, additional work necessary for completing the preparation of the fibre after leaving the machine, and the valuation of the machine as a whole. The jury, immediately after its labours, will address to the Minister a detailed report of the experiments and trials made, and of the results of the competition. Applications for admission, French or Foreign, must be sent directly to the Minister of Agriculture, 80, Rue de Varenne, Paris. They must reach there not later than the 15th June, 1888. Competitors, in their applications, must give the following particulars:—their names, surnames, rank, place of abode, nationality, the category in which they wish to compete, the speed of each machine, and the motive power required for it, the date of the invention of the machine, the name of the inventor, the sale price, the weight, the hourly yield of fibre, the number of machines already sold and working, and any other information which may be useful to the jury.

Classification.		t.m.c.c.
	Rates of Duty.	
Ginghams, not exceeding 28 ins. wide and not exceeding 30 yds. long	Piece	0.0.3 5
Handkerchiefs, not exceeding 1 yd. square	Dozen	0.0.2.5
Fustians, not exceeding 35 yds. long	Piece	0.2.0.0
Velveteens, not exceeding 34 yds. long	"	0.1.5.0
Cotton bed quilts	hundred	2.7.5.0
Cotton rags	100 catties	0.0.4.5
Do. raw	"	0.3.5.0
Do. thread	"	0.7.2.0
Do. yarn	"	0.7.0.0
Wool	"	0.3.5.0
Do. camels'	5 o/o ad val.	
Woollen and cotton mixtures, viz., lustres, plain and broadened, not exceeding 31 yds. long	Piece	0.2.0.0
Woollen manufactures:		
Blankets	Pair	0.2.0.0
Broadcloth and Spanish stripes, habit and medium cloth, 51 to 64 ins. wide	Chang	0.1.2.0
Long ells, 31 in. wide	"	0.0.4.5
Camlets, English, 31 in. wide	"	0.0.5.0
Do. Dutch, 33 ins. wide	"	0.1.0.0
Do. imitation, and bombazettes	"	0.0.3.5
Cassimeres, flannel, and narrow cloth	"	0.0.4.0
Lastings, 31 ins. wide	"	0.0.5.0
Do. imitation, and Orleans, 34 ins. wide	"	0.0.3.5
Bunting, not exceeding 24 ins. wide and 40 yds. long	Piece	0.2.0.0
Spanish stripes, inferior, including union cloth.	Chang	0.1.0.0
Woollen yarn	100 catties	3.0.0.0
Linen, coarse, as linen and cotton, or silk and linen, mixtures, not exceeding 50 yds. long	Piece	0.2.0.0
Linen, fine, as Irish or Scotch, not exceeding 50 yds. long	"	0.5.0.0
Carpeting, foreign.		
Including oil floor-cloth. (Excluding Chinese carpets)	Free.	
Carpeting and drugging, foreign	Free.	
Carpets and druggets,	Hundred	3.5.0.0
Not including foreign carpeting and drugging.		
Jute	100 catties	0.2.0.0
Velvets, not exceeding 34 yds. long	Piece	0.1.8.0
Silk:—		
Raw and thrown	100 catties	10.0.0.0
Yellow, from Szechwan	"	7.0.0.0
Reeled, from Dupions	"	5.0.0.0
Wild raw	"	2.5.0.0
Refuse	"	1.0.0.0
Cocoons	"	3.0.0.0
Do. refuse	5 o/o ad val.	
Cocoon skins (shells)		
Floss, Canton	100 catties	4.3.0.0
Do. from other provinces	"	10.0.0.0
Ribbons and thread	"	10.0.0.0
Do. interwoven with imitation gold or silver thread	or 5 o/o ad val.	
Piece goods, viz.:—pongees, shawls, scarfs, crape, satin, gauze, velvet, and embroidered goods	100 catties	12.0.0.0
Piece goods,—Szechwan, Shantung	"	4.5.0.0
Tassels	"	10.0.0.0
Caps	Hundred	0.9.0.0
Silk and cotton mixtures	100 catties	5.5.0.0
Not including French sateen or satin.		
Silk and linen mixtures. See linen.		
Silver thread, imitation	Catty	0.0.3.0
Do. real	"	1.3.0.0
Nankeen and native cotton cloths, including cottons dyed in China	100 catties	1.5.0.0

OF RUSSIA.

NOTE.—Poud = 36 lbs. avoirdupois. Funt = 0.902 lbs. avoirdupois. Gold rouble = 8s. 2d.

The following decisions affecting the classification of articles in the Russian Customs Tariff have recently been given by the Russian Government:—Fishing nets of cotton.—section 188, duty, 55 copecks per poud. Woollen plush, with patterns produced by a corrosive process.—section 202, duty, 1 rouble 10 copecks per poud. Jute yarn, twisted.—section 88, duty, 5 roubles 30 copecks per poud.

OF SPAIN.

NOTE.—Kilogramme = 2.204 lbs. avoirdupois. Peseta = 9.85 d.

According to the *Bolletino di Legislazione e Statistica Doganale e Commerciale* of March last, the following decisions affecting the classification of articles in the Spanish Customs Tariff had recently been given by the Spanish Customs authorities:—Tissues composed of warp

of cotton and silk in the proportion of 37 and 5.20 per cent. respectively, and with wool of wool and silk with 53 and 5.20 per cent. of each material; tissues composed of warp of cotton and silk and wool of wool and silk in the proportion of 39, 5.50, 50, and 5.50 per cent. respectively,—category 154, duty, 14 pesetas 40 cents. per kilog. Tissues of cotton and silk in the warp with 38 and 3 per cent. of each material, and with the wool of wool and silk in the proportion of 50 and 3 per cent. respectively,—category 161, duty, 5 pesetas per kilog.

Custom House Formalities in Mexico.

Exporters to Mexico should pay particular attention to the regulations which are stringently enforced by the Customs authorities in that country. All goods destined for one of the ports of the Mexican Republic must be accompanied by a consular invoice in triplicate, duly legalised by the resident Mexican consul or consular agent, either at the place whence the merchandise was dispatched, or at the port of shipment, and the invoice should contain:—the class, nationality, and the name of the vessel; the name and address of the consignee and the port of destination; the numbers and marks of each package; the numbers of packages and contents of the same; the gross, net, and legal weight of the packages; total length of tissues, breadth, and the number of the same; the material, name, and classification of the goods according to the tariff, place of manufacture, and the value of the merchandise. By net weight is meant the intrinsic weight of the goods, by legal weight that of the goods including bottles, boxes, and inner wrappers. One copy of the invoice should be sent by the speediest route to the consignee, and another to the head of the Custom House, the latter should, in fact, be forwarded by the Mexican consular agent, since all goods landed before they have been declared are liable to double duty. The consular invoices must be free from erasures, corrections, or interlining, or a penalty is incurred of about \$20. A consular certificate costs four piastres, the landing charges are paid according to a fixed scale, and the commission due to the consignee in Vera-Cruz varies from $\frac{1}{2}$ to 2 per cent., reckoned on the value of the goods, including freight expenses and import duty. The cost of carriage from Vera Cruz to Mexico runs from 80 to 54 $\frac{1}{2}$ piastres per ton, according to the nature of the merchandise. According to a recent law, goods imported via Vera-Cruz, can be addressed in bond to Mexico, so that the merchant is not compelled to pay the duty immediately on their arrival on Mexican territory, and the same privilege can be claimed for goods imported by the northern frontier, if addressed in bond to Chihuahua. No charge is made for bonding during the first 30 days, but after that period one real a day is paid on each package, and this charge is increased after a certain lapse of time.

Commercial Relations with Austria-Hungary.

The Austrian Ministry of Finance has just issued a supplement to the customs tariff voted last year. It fills 36 pages of quarto print, contains 413 clauses, and raises the duties on 58 articles on import, not by direct increase, but by altering the classification of these articles. Thus, English buckles, which formerly paid 15 fl. per 100 kilos, are now to be charged 50 fl., which is practically a prohibitive duty, and will inflict great loss on the trade of Walsall, where the English buckles are made, and whence they have been largely imported into Austria. A Vienna correspondent says:—"It is to be feared that no remission of any of the duties can be hoped for. The Foreign Minister, while anxious always to act in the most friendly way towards England, cannot interfere with the openly protective system inaugurated by the Ministry of Finance. Money is wanted in enormous sums for the armaments which the uncertainty of the political situation necessitates; and it must be found, even at the risk of the great loss to this country which must eventually accrue from the extinction of commercial relations with Great Britain. The imports from England are fast dwindling to nothing, this result being much assisted by the arbitrary manner in which duties are levied at the Custom House. The principle is to place every article made of divers materials in the highest class under which it can be charged. Pieces of cloth picked out with a silk thread by way of trade mark, riding whips with silk lashes, metal lamps with silk shades or fringes, have been weighed and charged for as if made of pure silk. Again, duties are heavily increased by adding to the weight of goods that of the receptacle which contains them. The oak chest carrying silver plate and the cardboard box enclosing artificial flowers or silk scarfs are all pressed into service in this fashion. Naturally, this system begets a lamentable amount of fraud, and a trial, still unfinished, in Vienna, has brought out evidence of the Revenue having been systematically cheated for years. But the system has another evil, for as the demand for English goods continues, notwithstanding the prohibitive duties, tradesmen must minister to it by spurious imitations of British goods, and falsifications of trade marks. There are shops in Vienna where so-called British goods are sold at prices that could not possibly be remunerative if the goods had paid duty."



London, 1851.



Manchester, 1875.



Bradford, 1882.



Amsterdam, 1883.



Calcutta, 1883-4.



Antwerp, 1885.



London, 1862.



Paris, 1867.



Moscow, 1872.



Vienna, 1873.



Paris, 1878.



Philadelphia, 1876.



Dublin, 1865.



Leeds, 1875.

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CONSIDERABLY ABOVE BOILING.

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ORIGINAL DESIGNS.

On our first page we give a design for a Tapestry Fabric. If produced in fine quality and tasteful colouring, a good effect will result. There is ample scope for a shuttled effect.

Our second plate shows another design for a Tapestry Fabric, which will be found of a pleasing character. This has been designed by Mr. C. W. Sandiforth, 103, Racecommon Road, Barnsley.

Our third contains a design for a Table Cover from our old contributor, Mr. Frank Layton, York Terrace, Akroydon, Halifax. This is offered as a suggestion to tapestry or linen manufacturers, for either of whom it is quite suitable.



MONTHLY TRADE REPORTS.

Wool.—At the Liverpool sales, held during the month, an average quantity of wools were sold at prices generally firm, with some slight exceptions. At the Edinburgh and Glasgow sales, although there was a fair attendance of buyers, the biddings were languid, yet owing to the light stocks in the hands of dealers rates were fully maintained. In the Yorkshire districts, an average business has been done and prices have kept firm, with a tendency for certain classes of wool to harder rates. The state of the yarn and piece branches has not been very encouraging, the prices and the small quantity of orders being very unsatisfactory. In the piece branch, the demand has been chiefly for botany stuff, cashmere and linings, whilst fancy goods have been rather quiet.

Cotton.—The demand for the raw material has kept up to the average, at firm prices, and the same may be said of yarns. Spinners of some classes of yarns have adhered to firmer quotations, which, in many cases, have been conceded. The cloth branches have improved slightly in demand, but prices have not kept pace with that demand, and manufacturers, in consequence, feel discouraged, from the fact that, in face of the recent strikes, they are placed in an unenviable position, as they cannot see their way to give any advance in wages in the present condition of business. The export trade to the East is still much affected by the money question, and there seems no prospect of an early alteration in this respect.

Woollen.—Business all round has improved during the past month with, perhaps, the exception of heavy goods, although some of these have partaken of the improvement. Fine fancy worsteds still meet with much attention, and mixed worsted and woollen fabrics have sold well, and in dark shades for coatings are likely to have a good run. The tweed branches have also improved in the finer and lower descriptions, but medium qualities, although selling moderately, are not so much in favour as other qualities. Full time is the general rule, and, in some cases, overtime is being worked. The outlook for this branch of trade is rather cheering.

Lace.—This trade has been languid and prices have been weaker. Orders for nearly all descriptions have been placed very sparingly, with the exception of the cheap kinds of curtains, and for these a very fair business has been done, but at rates that have ruled low. Fancy millinery laces have only sold in sufficient quantities to meet actual requirements, and there has been an entire absence of speculation. In cotton laces, the demand has been very slow, and orders have been few and small in bulk.

Linen.—A quiet feeling has pervaded the markets during the month in most classes of goods, the finer kinds of fabrics being most neglected. The demand for domestic cloths, as far as the home trade is concerned, has been moderately good, but for export, there has been a falling off. Damask table linens, and such like products, have been very quiet, and the same may be said of hand-made linens. The feeling in the flax branches has been slightly more cheerful, and in the jute trade, more business has been done at firmer rates, with a tendency upwards.

Consular and other Reports.

A foreign writer says with reference to German competition in China, that British manufacturers are losing ground in the Hong-Kong market, while the competition of German firms in coloured goods of pure and half wool is becoming more intense year by year, especially as regards so-called woollen and Spanish stripes, which are in great demand in the Chinese market. The French scarcely compete in this market, and there is only one large French firm in Hong-Kong, which attend to the supplies passing between Hong-Kong and Haiphong, and the goods pass, moreover, through several hands before reaching the Chinese market, whereas the Germans have established direct communication with Hong-Kong.

The Italian Minister of Commerce in his speech at the opening of the exhibition at Bologna, is reported by the *Industria* of Milan, to have laid stress upon the great increase of commercial activity now being witnessed amongst Italian producers, and to have drawn attention to the fact that Italian merchants and producers, instead of complaining in vain of the absence of any treaty of commerce with France, were adopting the most efficacious mode of searching for new outlets for their products, and of substituting new markets for those lost. In support of this assertion, reference was made to the extensive participation by Italians in various exhibitions now being held. It was stated that at the London Exhibition there are about 3,000 exhibitors, at the Barcelona Exhibition about 300, at the Brussels Exhibition 800, and at the Copenhagen Exhibition, which is limited, about 60 exhibitors of artistic industries, while even at Glasgow several important Italian establishments are represented. The exhibits are stated to be chiefly agrarian products, especially wine, and of artistic work, such as bronzes, products of the ceramic art, glass ware, wood manufactures, and lace.

Reporting from Santiago de Cuba on the trade of the south end of the Island, Mr. Vice-Consul Ramsden furnishes the following information respecting the imports of textile fabrics:—"Dry goods can undoubtedly be produced cheaper in England than elsewhere, but certain coloured and white cotton fabrics are put here at a lower price from Barcelona than they can be from England, owing to the differential duties in favour of Spanish manufacture, and this in spite of a higher rate of freight from Spain. White linen goods also cost less from Barcelona, provided they are of the coarser qualities, say, not over 16 threads to the inch. Common and cheap cotton blankets, and low qualities of cotton undershirts and hose, which formerly came from England, now also come from Spain. France supplies a certain class of goods, such as woven coloured drills, imitating thin tweeds, and used here for trousers, coats, &c.; these are not drills with the pattern printed on one side only, but the latter is woven of different coloured threads of fast colours. They cost somewhat more than they would if made in England, which country however, it appears, does not produce them, and dealers here also say that in this class of goods the French manufacture is preferable, because their patterns are prettier and more varied. A traveller lately here representing a Manchester firm, seeing at one of the dealers a sample book of these French patterns, offered to pay a good price to be allowed to take it away as a model, which, however, he was not permitted to do. Woollen and silk goods are of comparatively small importance in this place, but I may mention that, in addition to tweeds and broadcloths from England, a good many also come from Austria, and the more varied patterns seem to be the cause. English dry-goods firms have by no means lost their ground here, and this class of importations from England has not diminished in value of late years, though there have been the changes I have mentioned above. During last year, the value of dry goods from all parts may be estimated at £270,000 sterling, of which £220,000 worth have been supplied from Great Britain. The dealers say they find much greater facilities in dealing with England than with other parts, and more so when they want anything special to suit the wants of this market; for instance, if only a few pieces of a certain pattern are wanted, which may not be one of the usual make, or if goods are required to be duplicated, but of less width than the original ones, they have no difficulty in getting English manufacturers to change their rolls for that special object, even on a small order, whereas they say that in Spain they can get nothing done out of the usual routine. Jute bags, of which the annual consumption is some 300,000, come chiefly from England, but Spain, owing to the differential duties, is able to compete very closely in this article."



J. H. RILEY & CO., BURY, near Manchester.

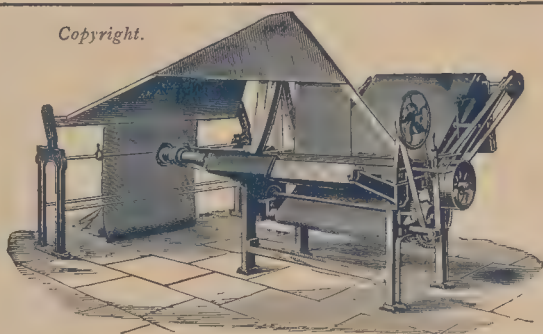
Specialities.

**RILEY'S PATENT FULL WIDTH
BURR EXTRACTING OR CARBONISING MACHINE**
for Dyed and Undyed Woollen Goods.

WET FINISHING MACHINE
for Bradford Dress Goods.

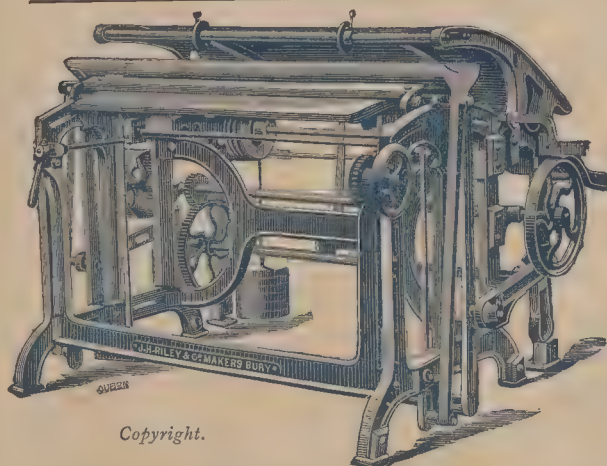
CALENDERS for Satteens, Italians, and every class of Textile Fabrics.

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ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing
Depôt, Pimlico, and to the Indian Government. References to a
large number of machines at work.



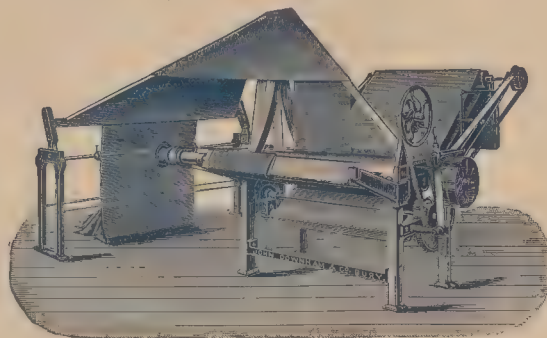
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RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.
We have some scores of these machines at work.

**J. H. RILEY & CO.,
BURY, NEAR MANCHESTER.**

JOHN DOWNHAM & Co. BURY, near Manchester.



ELDER'S RIGGING MACHINE,

WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

IMPROVED CUTTLING MACHINES

For Folding Single and Double Woollens and Worsted.

STEAM DRYING MACHINES,

WITH TIN AND COPPER CYLINDERS,

Calenders, Beetles, Dye Becks, Dye Jigs, &c.

Prices and Drawings on application.

J. H. PICKUP & CO.,

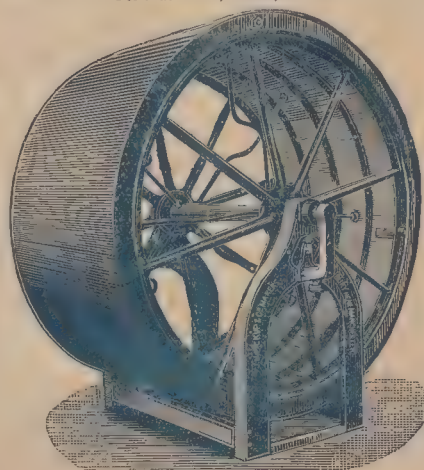
(Successors to JAMES ANKERS)

TIN-PLATE WORKERS, COPPERSMITHS, &C.,

Britannia Works, BURY, near Manchester,

Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,

For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for
Ring Frames,
Mules, Throstles,
Winding and
Warping Frames

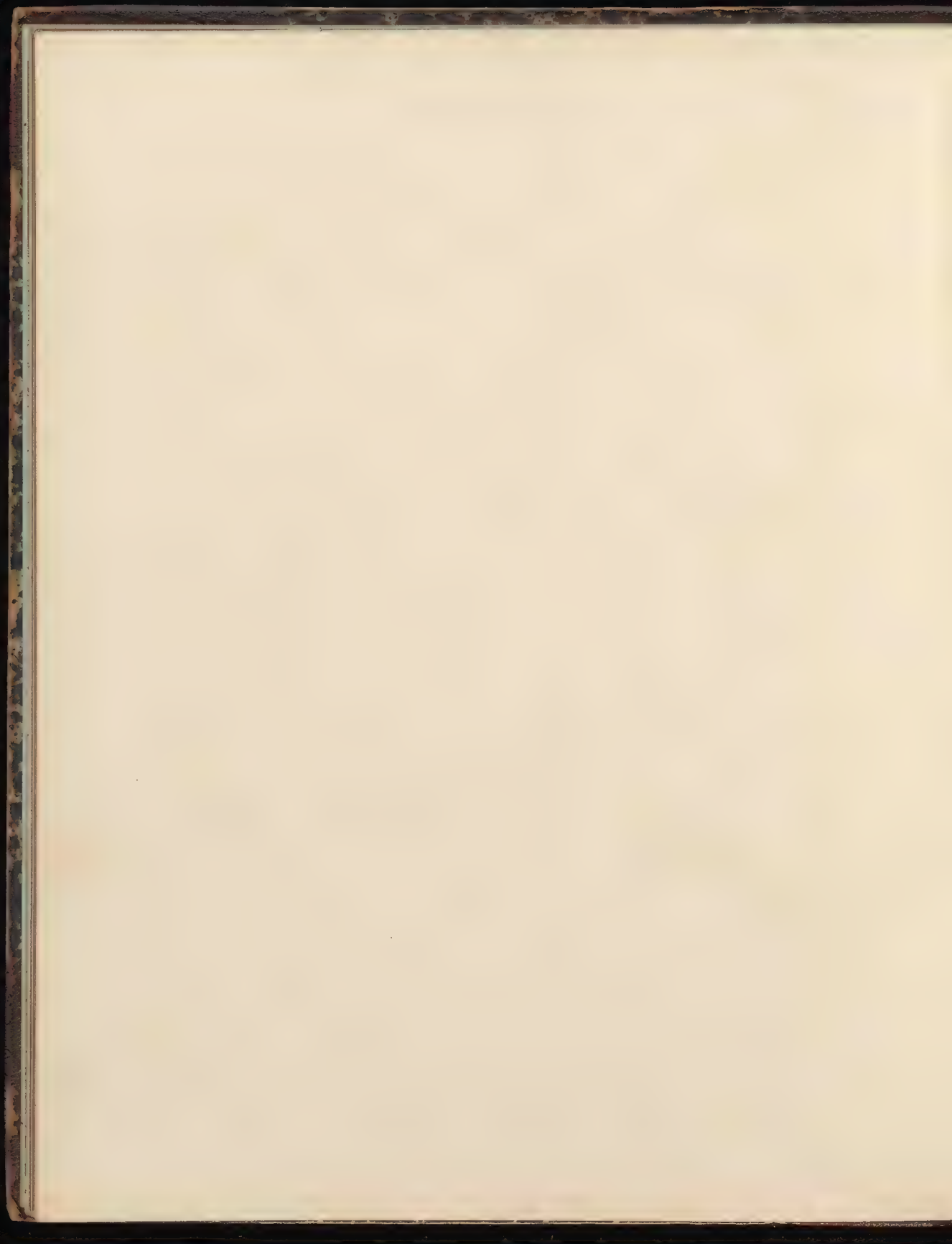
We have made a
speciality in Tin
Rollers, knowing
the importance of
Machinists and
Mill Owners hav-
ing a good and
true Roller to run
the speeds that
are now required.
Our Rollers are
made from the best
sheets, and put
together by very
efficient workmen.

LARGE STEAM DRYING CYLINDERS,

Any diameter up to 12-feet, and any length, either in Tin or Copper.

SINGLE CASED OR CAVITY CYLINDERS made on the most approved principle.
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.

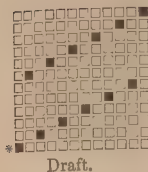




FASHIONABLE DESIGNS.

Worsted Trousering.

No. 528.



Plan.

Pegged to fall.

Draft.

Weight 17½ ozs.

Clear finish.

7,776 ends in the warp, viz.:—3,888 ends for the face, and 3888 ends for the back; 2 beams; 128 ends per inch; 20½'s slay; 6 ends in a reed; 63½ inches wide in the loom. London smoke worsted weft, 2/44's; 56 picks per inch; 54 inches wide when finished.

Face warp :—1 end Yellow Brown worsted 2/40's.

3 ends Bleached White	"	"
1 end Yellow Brown	"	"
5 ends Bloomed Drab	"	"
6 " Bleached White	"	"
5 " Bloomed Drab	"	"
1 end Violet	"	"
3 ends Bleached White	"	"
3 " Black	"	"
3 " Bleached White	"	"
1 end Violet	"	"
5 ends Bloomed Drab	"	"
6 " Bleached White	"	"
5 " Bloomed Drab	"	"

48

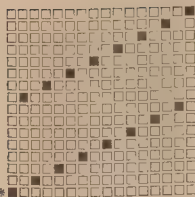
Backing warp :—1 end Bloomed Drab worsted 2/40's.

3 ends Bleached White	"	"
6 " Bloomed Drab	"	"
6 " Bleached White	"	"
6 " Bloomed Drab	"	"
3 " Bleached White	"	"
3 " Black	"	"
3 " Bleached White	"	"
6 " Bloomed Drab	"	"
6 " Bleached White	"	"
5 " Bloomed Drab	"	"

48

Worsted Suiting.

No. 529.



Plan.

Pegged to fall.

Draft.

Face warp :—10 ends Light Brown Drab worsted 2/48's.
1 end " Lavender " "
4 ends Black worsted 2/40's.
1 end Light Lavender worsted 2/48's.
Repeat for the backing warp.

Weaving :—12 picks bleached White worsted 2/48's.

1 pick Cardinal worsted 2/40's.
2 picks Black " "
1 pick Cardinal " "

7,410 ends in the warp, viz.:—3,720 ends for the face, and 3,720 ends for the back; 2 beams; 15½'s slay; 8 ends in a reed; 60 inches wide in the loom; 62 picks per inch; clear finish; 54 inches wide when finished. Weight 15 ozs.

Tweed Suitings.

No. 530.



Warp :—All White, 20 skeins, twisted to Green Mixture, 10 skeins.

Woven :—All Brown, 20 skeins, twisted to Drab, 10 skeins.

Design.

Straight Draft.

1,152 ends in warp; 18 ends per inch; 18 picks per inch; 4 healds; 9's slay; 2 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight 22 ozs. to the yard.

No. 531.

Warp :—

16 ends Grey Mixture, 12 skeins.
1 end Orange, 20 skeins, twisted to Black, 20 skeins.

1 " Slate, 20 skeins, twisted to Black, 20 skeins.
2 ends Dark Olive Mixture, 12 skeins.

Design. 18 " Grey Mixture, 12 skeins.
3 " Dark Olive Mixture, 12 skeins.

Straight 1 end Orange, 20 skeins, twisted to Black, 20 skeins.
Draft. skeins.

1 " Slate, 20 skeins, twisted to Black, 20 skeins.
2 ends Dark Olive, 12 skeins.

Woven :—

1 pick Blue, 24 skeins, White 24 skeins, and Canary 24 skeins, twisted together.

2 picks Light Olive, 12 skeins.

3 " White, 12 skeins.

2 " Light Olive, 12 skeins.

1 pick Crimson, 24 skeins, White 24 skeins, and Canary 24 skeins, twisted together.

7 picks Light Olive, 12 skeins.

1 pick Brown, 24 skeins, twisted to 24 skeins White } 3
1 " Light Olive, 12 skeins. } times.

6 picks " " "

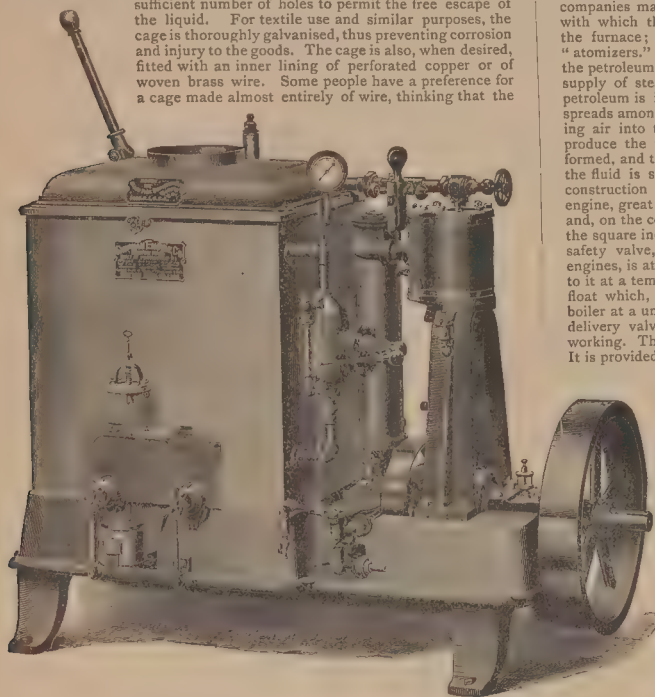
1,792 ends in warp; 28 ends per inch; 28 picks per inch; 8 healds; 14's slay; 2 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight 22 ozs. to the yard.

The School for Advanced Commercial Studies.

The following is an extract translated from *Le Petit Journal* of the 23rd ultimo, on the above subject. It proves that our French neighbours are keenly alive to the pressing necessity of using all lawful means for the promotion of commercial education in order to further trade interests. The Paris Chamber of Commerce have spent over 2,000,000 frs. (£80,000) upon the School for Advanced Commercial Studies, which they founded in 1881 on the Boulevard Malesherbes. Desirous of developing among the pupils a taste for foreign travel, the Chamber of Commerce have just decided to establish for the next term courses of Arabic, Chinese, and Russian. The school, which consists at present of 150 pupils, is prepared to receive a much larger number, and we hope before long it will be quite full, its muster having steadily increased. We may mention that the institution is splendidly established upon a piece of land of over 6,000 metres, situated on the Boulevard Malesherbes and Rue de Tocqueville. The buildings consist of two large theatres, school-rooms, examination rooms, a commercial museum, laboratories, a library, a fencing saloon, a vast dining hall for 300 pupils, and spacious dormitories where each pupil has his own room, for the school receives boarders as well as day scholars. The State, the Municipal Council of Paris, the Conseil General of the Seine, the Conseils-Generaux of several departments, Chambers of Commerce, the Bank of France, the Crédit Industriel et Commercial, the Crédit Lyonnais, the Comptoir d'Escompte, the Gas Company, the Syndicate of Exchange Brokers, the Bankers' Union, &c., maintain scholarships, which, although of recent creation, have given very considerable results, for among the past pupils 30 are to be found in Germany and England, 17 are located in America, 2 in Australia, 2 in China, and 1 in Japan. Finally, among past pupils with diplomas, three have entered the consular service, and all the others have found places in commerce or manufactures, and it is important to note that nearly all the firms who have employed old pupils apply exclusively to the school to recruit their staff. The exceptional and opportune attention given to the study of foreign languages has contributed in a great measure to the success of the institution.



the revolving cage. This is a most simple apparatus, consisting of a pulley which runs loose upon the shaft—and may, therefore, stand when the shaft is revolving—and a pair of friction arms firmly secured to the shaft, and so constructed that they may expand a little, radially, when in motion, and thus bind themselves against the inside of the rim of the pulley. When the shaft is revolving and it is desired to start the pulley, two small wedges are withdrawn by a hand lever. This allows the friction arms to expand by centrifugal action against the inside of the rim of the pulley, and to carry the latter gradually round with them, gently, but as quick as may be desired, bringing the cage up to full speed without any shifting or slipping of the belt, and without throwing any sudden strain upon it or on any part of the machine. When it is desired to stop the machine, the wedges are pushed home, and the power being thus instantly withdrawn, the brake may be applied, and the machine brought to rest in a few seconds. We may add that the apparatus is quite automatic in its action, and has none of the screws or complicated mechanism found in many friction gears. This firm prefer to make the cages of their machines of mild steel plates, perforated with a sufficient number of holes to permit the free escape of the liquid. For textile use and similar purposes, the cage is thoroughly galvanised, thus preventing corrosion and injury to the goods. The cage is also, when desired, fitted with an inner lining of perforated copper or of woven brass wire. Some people have a preference for a cage made almost entirely of wire, thinking that the



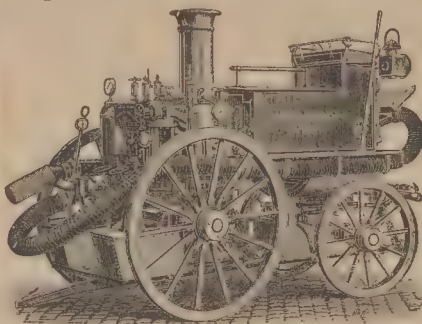
Shipman Automatic Steam Engine.

largeness of the openings between the rings of wire must help the material to dry quicker. This is quite a mistake, the very largeness of the openings defeats their object by allowing the material to fill them, thus preventing the free escape of the liquid. Still, wire cages may be had if desired, as also may cages of brass, copper, phosphor-bronze and other materials. The large central cone usually found in the cages of extractors is dispensed with in these machines, there being merely a small vertical spindle, and in the smaller sizes not even this. Thus, practically, the whole of the cage of the extractor is available for the goods, and as the cages are also deeper and have much wider lips or covers than usual, a larger quantity of material may be placed in them and dried at one time. The construction of the machine enables the cages to be made of almost any depth. In the making of the outer cases, the use of cast iron has been discarded, as not being sufficiently strong. From the construction of the hydro-extractor, it follows that the greater the pressure that is induced in the revolving cage by centrifugal action, the more efficient is the machine. This pressure is sometimes as much as 120 lbs. to the square inch. Bearing this in mind, it will be readily understood that there is an element of danger connected with machinery of this kind. Having this consideration in view, the firm construct their outer cases of strong boiler plate. They may, therefore, be considered "safety" cases. Whilst provision is made for actual lubrication of every bearing in the extractors, the quantity of oil actually consumed is trifling. The revolving spindle simply spins in a bath of oil, and after the machine has run a few days, and thus settled into working order, it will continue for months without requiring fresh oil. Also, owing to the self-balancing feature of the machine, the freedom from undue friction thus secured, and the efficient methods of lubrication adopted, the cost for repairs has been found to be quite nominal. The firm claim the following amongst other advantages for their hydro-extractor:—The machine can be driven at the highest desirable speed with the smallest consumption of

power; however unequally loaded, within the limits of practical work, little or no vibration is transmitted to the frame or building, and, consequently, the machine may be worked in almost any place or position: the usual massive foundation is dispensed with—a good firm floor constituting foundation sufficient; the wear and tear is insignificant—there being no costly bushes constantly under severe strain, and, therefore, requiring to be often renewed. Messrs. Watson, Laidlaw and Co. have received a large number of testimonials speaking in terms of the highest praise of their hydro-extractors.

THE SHIPMAN AUTOMATIC STEAM ENGINE.

This engine, which is an American invention, has been patented by the Shipman Engine Co., of Boston, in Great Britain, France, Germany, Holland, Belgium, and other countries. The selling agents for Scotland are Messrs. John Donald and Son, Glasgow. The engine burns petroleum, and the company claim that it is safer than any lamp, and state that insurance companies make no additional charge where it is used. The petroleum with which the boiler is heated is propelled in the form of fine spray into the furnace; this is done by means of a steam jet, through a pair of "atomizers." The diaphragm controls the quantity of steam which urges the petroleum spray into the furnace, and is adjustable so as to cut off the supply of steam and extinguish the fires at any desired pressure. The petroleum is ignited in the furnace, and gives out a very hot flame, which spreads among the tubes of the boiler. The ignition takes place by pumping air into the boiler, and making use of the pressure thus obtained to produce the petroleum spray. After a few minutes' pumping, steam is formed, and the use of the air pump is discontinued. The combustion of the fluid is so perfect that neither smoke nor smell is produced. In the construction of the tubular boiler, which supplies steam to an ordinary engine, great care is taken that each tube is tested by hydraulic pressure, and, on the completion of the boiler, it is tested by a pressure of 400 lbs. to the square inch, whilst the working pressure is only from 100 to 120 lbs. A safety valve, loaded on the same principle as those used in locomotive engines, is attached to the boiler, and a water-heater delivers the feed water to it at a temperature of 150° to 180°. The water supply is regulated by a float which, controlling the suction of the pump, keeps the water in the boiler at a uniform level. The pump is of brass, with proper suction and delivery valves, and whenever the engine is in motion, it is constantly working. The cut-off valve is of the "piston" type, and perfectly balanced. It is provided with a governor of the "Hartnell" type, which acts directly



Shand, Mason and Co's Steam Fire Engine.

on the valve, varying the cut-off with every change in the speed of the engine, and ensuring uniformity of motion. The cylinders are automatically supplied with oil by means of a sight-feed lubricator, and the main shaft and slippers are furnished with proper oil cups, the connecting rod being lubricated automatically. The materials and workmanship of the steam engine are guaranteed to be of the highest class throughout. The crank pins are of hardened steel; the piston is furnished with packing rings; every wearing part is provided with well devised means of adjustment, and the wearing surfaces are unusually large. No skilled attention is required when the engine is at work, because, as long as oil is supplied to the "atomizers," and water to the pump, the engine takes care of itself.

MESSRS. SHAND, MASON AND CO'S STEAM FIRE ENGINE.

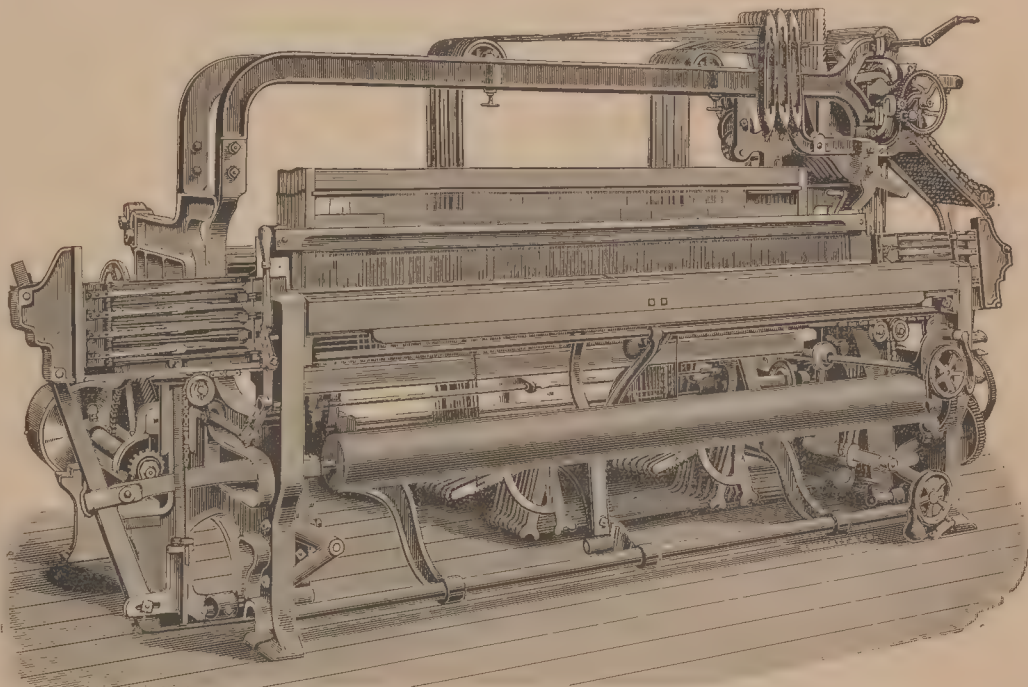
For the protection of the Glasgow International Exhibition from fire, two powerful steam fire engines have been provided, one capable of discharging 450 gallons of water per minute, and of throwing a jet 1½ inches in diameter to a height of 170, and the other 360 gallons per minute, and of throwing a 1½ inch jet to a height of 160 feet. The larger engine is stationed on the bank of the river Kelvin, which runs through the grounds, the suction pipe being kept immersed, and everything in readiness for an outbreak. The other engine, of which we give an illustration, is also placed ready for use at a few minutes' notice. Both engines are by Messrs. Shand, Mason and Co., London, and are of their patent equilibrium type. The following description may be of interest to our readers. It has three steam cylinders, the piston rods of which are coupled direct to the rams of three double-acting bucket and plunger pumps. From a joint in the bottom of each ram, the connecting rod extends to the pin of a three throw crank shaft, an arrangement which gives great strength and directness of action. The triple cylinder and pump enable it to start in any position directly the steam is

International Exhibition, Glasgow.

MESSRS. HUTCHINSON, HOLLINGWORTH AND CO., LIMITED,
OF DOBCROSS, NEAR OLDHAM.

The firm of Hutchinson, Hollingworth and Co., Limited, have a wide reputation for the making of high-class looms, and those shown at the Exhibition fully maintain this enviable notoriety. This exhibit may be described as follows:—One Hollingworth and Knowles' patent open shed, fast, woollen loom, 90 in. reed space, 16's harness, double beam, 4 boxes at each end. This loom is capable of weaving with seven shuttles, and is specially adapted for weaving Scotch tweeds, &c. Speed, 85 picks per minute. One Hollingworth and Knowles' patent open shed, fast running loom, 90 in. reed space, 36's harness, double beam, 4 boxes at each end. This loom is capable of weaving with seven shuttles, and is specially adapted for worsted coatings, &c. Speed running at the Exhibition, 80 picks per minute. We append a few particulars of the Hollingworth and Knowles' open shed loom. The motion of the harness, from top to bottom, is one movement instead of two, as in the closed shed, thus saving one quarter the

get out of harmony with it, and consequently the loom can never put the wrong filling in any shed. The drop boxes are operated by cranks, set at the opposite ends of their throw, and the chain controls the boxes positively, and will call anyone designated by the chain without any setting of cams or lifters. The boxes at each end are operated independently of each other, so that seven shuttles may be conveniently used, and a great speed attained without jumping or jarring. We are informed that no combination of box changes can be desired that this mechanism will not work as readily as the most simple patterns, whilst no skill whatever is required on the part of the operator. When the chain is made up, and put upon the loom, it will command the right box, and cannot be made to do otherwise. The makers have attached to this loom their let-off motion, viz.:—the worm and worm wheel. This motion has now been thoroughly tested for years, and has given the greatest satisfaction, as the many thousands now in use testify. Another valuable addition to this loom is the patented improvement for changing the speed at which the loom is run to suit the different classes of goods requiring to be woven. By this improvement, the speed of the loom can be increased or decreased one-third, in a very short space of time, by the simple method adopted. The loom is also provided with an irregular beat motion, whereby the speed of the lay at the cloth-making point is greatly increased, and, consequently, decreased while the shuttle is passing through the warp, thus enabling the loom to put in a greater number of picks, and affording more time for the shuttle to get home before the boxes change.



Hutchinson and Knowles' Patent Open Shed Loom.

time in each pick. The change of pattern chain occurs when the shuttle is passing, and whilst the harnesses are open and at rest, thus saving all the time of such change at each pick. The pattern chain is driven by a gear and pinion, and is a constant, and not an intermittent, motion. This is of great advantage when long patterns are being woven which require a heavy pattern chain. Each harness is driven by a crank pin upon the side of the gear, thus giving a movement upon the yarn which is extremely easy, and is very desirable, especially upon tender yarn. This peculiar harness motion will allow a much larger shuttle to pass through the same opening of the warp, or the ordinary sized shuttle through a much smaller opening, thus avoiding much of the strain and the consequent wearing of the same. The reason for this is, that the harnesses arrive at their full opening before the shuttle starts from the box, and remain open and at rest, until it arrives in the opposite box. The construction of the harness motion shows first-class workmanship. The gears are of cast steel, turned, cut, and hardened. The harness levers are of steel, finished and hardened at all the working points, so that wear or breakage is reduced to a minimum. An important improvement in the top jack and connector, ensures a certain and effective locking of the levers, enabling the loom to weave heavier goods than have hitherto been woven in looms of this class. The chain rolls are turned and hardened, and run in steel pockets, so that when in use no pressure comes upon the chain bar or links, thus removing a great source of mis-picks by crooked bars. The pattern chain for the boxes is upon the same shaft as the harness chain, and cannot

MESSRS. WATSON, LAIDLAW AND CO., GLASGOW.

This firm show hydro-extractors, a type of machine for the making of which they are well known. In our issue of last June, we gave a notice of the firm's exhibit at the Manchester Exhibition, and our readers will find that notice to contain many interesting particulars. With reference to the present exhibit, we may state that two distinct types of extractors are made by the firm. First, the suspended or over-driven type, and secondly, the pivot or under-driven type. We are aware that a prejudice has grown up in some districts against over-driven machines, but we are not surprised at this, as in the ordinary type of extractor the driving gear is very cumbersome and much in the way of the man working the machine, and, at the same time, oil and dirt are very liable to fall down from it upon the goods in the cage. The suspended or over-driven machines made by this firm are free from these objections, the driving gear being simple and out of the way, and there being no liability of oil escaping upon the goods, as it is contained inside the hollow suspended spindle. It is scarcely necessary to say that these machines are driven by belts. The hydro-extractor being a quick speed machine, a belt drive naturally suggests itself, not only as the simplest, but also the least troublesome and most economical that can be adopted, nevertheless, objections are urged against belts on account of their liability to slip, and the trouble and wear and tear involved in shifting. This firm meet these objections by the patent centrifugal friction pulley, which they supply with each machine, and which drives on the spindle of

A Foreign Textile Work.

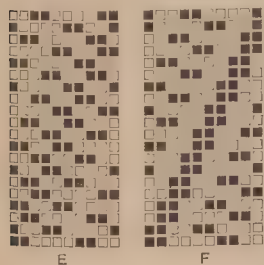
To the Editors of the Journal of Fabrics and Textile Industries.

GENTLEMEN,

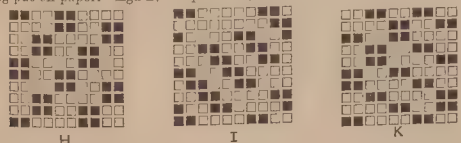
In your issue of April last you have the continuation of an article under the above title, in which occurs a passage many people might, and with good reason, take exception to. The writer says, "Take an example:—In Fig. 28 is furnished a design of an ordinary twill class, which it is required to modify in such a way as to produce another pattern of an unknown, or undetermined, structure; for it is impossible, on this irrational system of designing, to form any idea of what will be the result of transposing the threads of a given crossing until the experiment has been made." In the first place, this sentence would suggest to my mind that the author of the article has misunderstood the intention of the author of the "Foreign Textile Work," or his words are liable to be misunderstood by others. He says it is required to modify an ordinary twill "in such a way as to produce another pattern of an unknown or an undetermined structure." It seems to me that the object is not to modify, but to take the "ordinary twill" as a base, and by re-arrangement to produce altogether different patterns. This means something more than modifying. It would require a great stretch of imagination to say that the patterns given at Figs. 16 to 21 were mere modifications of Fig. 15. They are different in style and character, and would require different treatment in the fabric, though they come from the same base. Then the question arises, can this be called an "irrational system of designing," where it will be impossible "to form any idea of the result of transposing the threads?" I venture to say there is nothing irrational about it; it is most rational. It gives the greatest possible power of pattern producing, and if it were better understood amongst designers generally, it would be the most valuable power in their hands. Either examine the patterns which are given as illustrations in the April number, or refer to those given in the March number, and it will be seen at a glance that there is no "chance" in the combination. The question may be asked—where is the element of certainty as to the character of a pattern produced by such a system of arrangement? The answer would be, the character would be well determined beforehand by a comparison of the basis of arrangement with the order of interweaving of each individual thread. Take, for example, the four patterns—A, B, C, and



D, and compare them. A and C have the same basis of arrangement, and so have B and D, but in each case the results are different. The order of arrangement and the order of interweaving in A are so related to each other that a distinctly horizontal twill of a solid character is produced; whereas in C, although when applied to a properly arranged cloth, there is a horizontal twill, on paper it presents the appearance of a vertical twill. It is the mere dividing of the four dots in each warp thread, and throwing them into a different relation to the basis of re-arrangement which produces this effect. The same remark will apply to B and D. In the one case there is a solid, well defined, twill, in the other, a pattern of apparently no character. B and C are closely related to each other in the character of effect which they may be made to produce. It is in many cases the lack of knowledge of the proper construction of the cloth to suit the pattern which brings in the possibility of "chance." Refer back to Figs. 7 and 8, they both belong to the "chance" order. Yet they have both been often employed, and produced good fabrics. The pattern C belongs to the "chance" order of the same family as Fig. 6, yet there have been many thousands of pieces of these "corkscrews," as they have been named, made during the last few years. The "chance" in this case has not been in the "production of another pattern of unknown or undetermined structure," so far as the arrangement of the pattern has been concerned, but in the determination of the proper arrangement and balance of material to produce a "structure" of cloth suitable to the pattern. To turn to another form of arrangement, or rather of combination, take the pattern given at Fig. 4, which is simply a combination of two twills, or rather of one twill with itself, a pick of each alternately. Figs. E and F consist of the same combination precisely, but the effect is different. The two



parts of the patterns are placed in different positions in relation to each other, but the result of this alteration of position is self evident to the mind before being put on paper. Again, the patterns, H, I, K, come from the same base,



but, instead of every pick of the originals being taken, only every alternate pick is made use of. Yet the result of the combination, when the two

patterns are placed in certain positions in relation to each other, can be predicted with absolute certainty, and the character of the resulting pattern foreshadowed, as well as the class of cloth for which it is suitable. It would be an easy matter to multiply these illustrations by the hundred, and to show most conclusively that, when the principle is understood, there is no "chance" whatever, and that not only are such "theories plausible and rational" but also if a proper knowledge of the application of design to fabric accompanies the knowledge of placing the pattern upon paper, the "chances of obtaining a well-balanced pattern are on a par with those of winning a game of dice" when one player knows that his dice is loaded, and, therefore, he is bound to win. It is "a species of manœuvring and dodging" to be highly commended to, and thoroughly mastered by, the

YOUNG DESIGNER.

Situation of the Trade in Women's Woollen Stuffs

Kuhlowl's Gazette says:—"The spring business which had to suffer from the continual rawness of the weather, was nevertheless extensive in respect of half-woollen waterproofs. The result of this was that the wholesale merchants showed a more enterprising spirit in the purchase of these goods for the autumn season, and distributed large and timely orders for autumn among the Holstein cloth factories that make a speciality of this particular class of wares, producing them of a suitable weight, in popular patterns and at reasonable prices. The Holstein cloth factories are therefore overwhelmed with work just at present. The satisfactory situation of the woollen goods trade has, however, induced the weavers of Neumünster to strike work until their demands for shorter hours and higher wages have been satisfied. This event may prove of no mean danger to the branch of industry in question, which concerns itself primarily with goods sold easily on account of their cheapness, and therefore not yielding a high rate of profit, or permitting of high wages. In piece-dyed goods, other places, such as Worms, have long ago commenced the manufacture of half-woollen waterproof stuffs, and there are probabilities that in view of the present situation they will endeavour to produce those stuffs which have hitherto been the specialities of Neumünster. The cheap waterproof mantle stuffs produced in Berlin, which are mostly rough-napped and striped are also in good request. For the approaching winter, carded yarn stuffs, eskimos, and doubles are being largely purchased as mass articles; while soleil, a narrow ribbed worsted stuff, is also popular. As the manufacturers happen to have produced very little of the latter article, the few stocks were rapidly caught up. Both in carded yarn and worsted stuffs changes of pattern are produced by stripes. For next winter season, tricôt stuffs are likely to find wide acceptance. Walk crimmer (curls) have been produced in some new patterns which are in demand."

Colonial Parcel Post.

(Compensation for Loss and Damage of Parcels).

The Postmaster-General has announced that he will (not in consequence of any legal liability, but voluntarily, and as an act of grace) give compensation to an amount not exceeding 20s. for the loss and damage of parcels sent by parcel post between the United Kingdom and the following British Colonies or dependencies respectively, viz.:—The Isle of Ascension, Barbadoes, British Guiana, British Honduras, Ceylon, Cyprus, Gibraltar, Grenada, Hong-Kong, Labuan, North Borneo, St. Lucia, St. Vincent, South Australia, the Straits Settlements, and Trinidad. The compensation given in case of damage will be in proportion to that which would have been given had the parcel been lost. No legal liability to give compensation in respect of any parcel will attach to the Postmaster-General, either personally or in his official capacity. Accordingly, the decision of the Postmaster-General as to all questions of compensation will be final.

Parcel Post to Switzerland via France (Closed Mails.—Reduced Postage for Light Parcels).

It has been arranged that parcels not exceeding 7 lbs. in weight, posted at any post office in the United Kingdom for transmission to Switzerland, will be sent from London in closed mails, via France. As the mails are not to be opened from the time they leave London to the time they reach Switzerland, greater rapidity of transmission and other advantages are secured. Rates of postage for a parcel not exceeding 3 lbs. in weight, 1s. 6d.; exceeding 3 lbs. but not exceeding 7 lbs. in weight, 2s.—Board of Trade Journal.

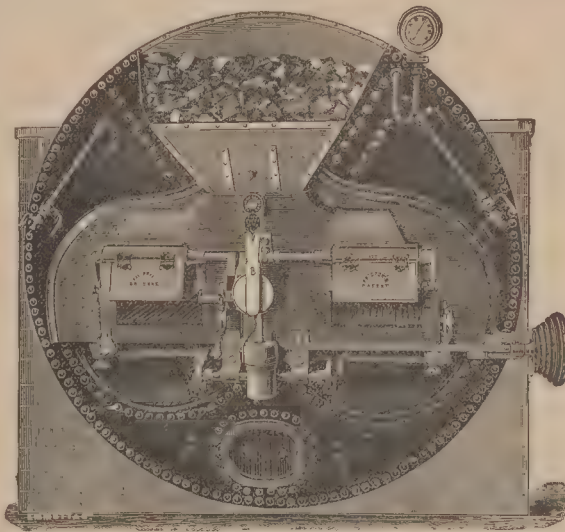
A Berlin correspondent says that the Berlin millinery trade is still remarkably quiet as regards summer goods, and the only important orders received lately have been for dust mantles made of "gloria" materials. There is also some inquiry for striped zephyr costumes. The travellers of the large millinery establishments in Berlin are leaving for various European countries, and are taking with them a rich collection of patterns, consisting to a great extent of plain and striped Cheviots. Closely-fitting jackets seem to predominate, and black and grey Persian trimmings will probably become fashionable next season. Some of the American buyers have recently arrived in Berlin, and so far seem to have a preference for diagonal Cheviot and striped Vienna materials.

turned on, and its three-double acting pumps give an extremely steady water supply, apparently as regular and steady as that obtained from gravitation. The slide valves on the steam cylinder are of the ordinary construction, worked by a simple arrangement of levers in such a way that one engine actuates the valve of another. The boiler feed pump is worked by an eccentric on one end of the crank shaft, and provision is made for a ratchet lever on the other, so that the engine can be turned in the engine house. An improved simple form of injector is also provided. The boiler is of Messrs. Shand, Mason and Co.'s patent inclined water tube description, and is a rapid and powerful generator of steam, 100 lbs. to the square inch being obtained from cold water in 6 to 8 minutes. The whole engine is mounted on four wheels, and has provision for carrying the engineer, stoker, and seven firemen, with coals, &c., necessary to work it. Steam fire engines of the same description, and by the same makers, are in use in the principal manufacturing towns in the Northern and Midland Counties, the chief points of difference being the improvements that have been recently added. These include an increase of the area of the steam cylinder and the valve area of the pump, thus obtaining a larger delivery of water at a higher pressure. The lubricating apparatus has also received some important improvements, as also the method of feeding the boiler, both by feed pump and injector. Additional heating surface has been provided in the boiler to suit the increased power of the engine, and amongst other alterations in the fittings may be mentioned improved forms of safety valve and blast regulator. Steel has been substituted for wrought iron wherever possible, so as to keep down the weight of the engine. Messrs. Shand, Mason and Co.'s patent equilibrium engines have been in use for many years in the following towns:—Bradford, Blackburn (2 engines), Bolton, Burnley (2 engines), Bury (2 engines), Glasgow (7 engines), Huddersfield, Halifax, Keighley (2 engines), Leeds (2 engines), Leicester, Middleton, Nottingham, Paisley, Preston, Salford, Sheffield, Stockport; while the following, amongst other manufacturers, have similar engines for their own premises:—Messrs. Crossley and Sons, Halifax; Foster and Son, Bradford; Garnett and Co., Bradford; Steiner and Co., Accrington; J. and J. Colman, Norwich; Cowan and Sons, Musselburgh; J. and J. Clark, and J. and P. Coats, Paisley; Messrs. Horrocks, Miller and Co., Preston; W. and J. Don and Co., Forfar, &c., &c. Of course, the engines are finished in the very best style, both as regards paint and polish, and we have no doubt that should circumstances arise which demand their use, they will give a very good account of themselves. The steam fire engines, and the whole of the fire extinguishing apparatus at the Exhibition, are in the hands of the Glasgow Fire Brigade, under the direction of their chief, Superintendent Paterson.

PROCTOR'S MECHANICAL STOKER.

Mr. J. Proctor, of Hammerton Street Ironworks, Burnley, shows two of his new patent mechanical stokers, one being in actual work upon a boiler in the machinery section, and the other at Stand 476, where it may be seen in motion, and all the working parts inspected. In connection with mechanical stokers, the name of Proctor is well known amongst users of steam, and had notoriety been necessary, Mr. Proctor certainly obtained it in the two actions in the law courts during 1887. The first of these actions was brought to restrain others from infringing the patent rights held by Mr. Proctor. This being decided in favour of the plaintiff, another action followed in a higher court with the same result. Mr. Proctor claims to be the original inventor of the radial shovel with tappet and spring. In estimating the value placed upon the stoker by practical men, we may state that no fewer than 4,000 such mechanisms are in use at the present time, and this number is being daily increased. Prize medals were awarded to it at the Smoke Abatement Exhibitions in London and Manchester in 1882, at the Inventions Exhibition, London, in 1885, and at the Yorkshire Jubilee Exhibition, at Saltaire, in 1887. The inventor has been continually on the alert in making improvements in his machine, as is proved by the patents he has taken out in 1878, 1879, 1880, 1882, 1884, and 1885. Many of these having for their object the rendering of the stoker thoroughly efficient, whilst reducing the number of intricate working parts. Some of the important improvements consist in dispensing with buffers and buffer springs without substituting anything in their places, which considerably reduces the wear and tear, and causes the machine to work almost without noise; also in using a large feed or hopper pipe, so that large pieces of coal cannot possibly jam fast, and stop the feed; the inventor having dispensed with the crushing or grinding mechanism, he can now use both bulky and slack with this arrangement of hopper; the ram is worked from the top of the hopper box instead of underneath as in the previous patent; this arrangement entirely prevents the small dust falling through the slot in the bottom of the hopper, through which the ram lever formerly worked,

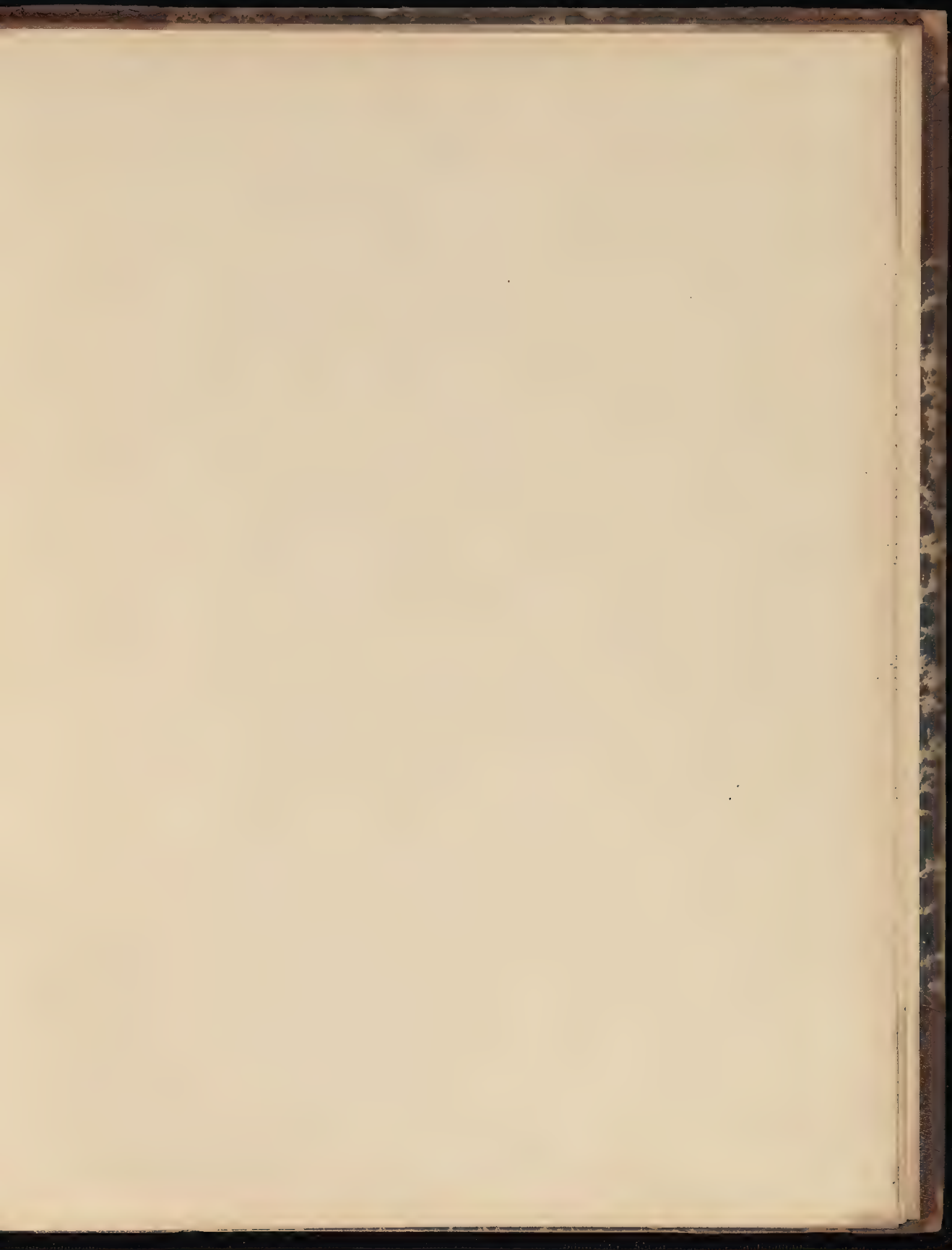
We may here give the result of a test made with this stoker by Mr. Longridge, chief engineer of the Engine and Boiler Insurance Company, Limited, Manchester, which showed that 9·4 lbs. of water was evaporated per lb. of coal—water at 110°—with a common slack, of which the price at the colliery was 3s 3d. per ton. The patent moveable and self-cleaning fire bars are a feature of the machine. This arrangement of moving bars can be used under the following conditions: 1st.—As self-cleaning—to carry the clinker off the bars into the ashpit behind, dispensing with the ordinary method of cleaning out at the front. 2nd.—As non-self-cleaning—to be put in motion when the fires become dirty, which breaks up the clinker, and to remain stationary after the fires have been cleaned out in the ordinary manner, by which means the fires can be worked longer before cleaning out. 3rd.—As a hand moving bar. The value of the three methods of working will be most appreciated where coals are used of a soldering tendency, and these arrangements, as they can be put in and out of gear at will, enable the user to accommodate the working of them to suit the various classes of coal and conditions that are existent. The fact that this invention has been before the public over 12 years, and there is still a great demand for it, is a forcible proof of its utility.



Proctor's Mechanical Stoker.

An Improved Leno Weaving Apparatus.

Mr. W. J. Riley, manufacturer, Colne, has recently patented an improved apparatus for leno weaving, which has for its object the reduction of the friction upon the yarn at the time of the "cross," and the enabling the double lift jacquards to be employed with facility for this class of weaving. To effect these objects, a slack-taking-up, or tension, motion, for the warp yarn, of a special character, as well as a special lifting motion for that portion of the heads or harness carrying the ends, over which the dupe heads or harness cross, in such a manner that, at any or every pick, the warp yarns are sufficiently lifted to attain a position at which the cross or leno may take place with a small amount of friction. To form the slack-taking-up or tension motion, a set of harness and lingoes is used at the back of the loom, through which that portion of the warp yarn is passed after leaving the back beam or rest, which is actuated by the dupe heads, and thus requires to be let slack at the time of the "cross." The yarn, after passing through this harness, is passed underneath a rod or roller, and thence to the ordinary harness. These back heads, or harness, are so set as to be in a lifted position during the operation of plain weaving, and are held in this lifted position by being attached to the ends of levers fixed or turned on a fulcrum, or fulcrums above, and counterbalanced by springs or other elastic means. The ends of these levers connected with the springs are attached, by strings or wires, either to hooks in the jacquard, set apart for the purpose, or to the hooks actuating the leno harness, so that, when the same are lifted, the ends of the levers carrying the tension harness are depressed, and the lingoes allowed to pull down the yarn, and thus slack it out for the "cross" to take place. The special, or extra, lifting motion for the weaving harness or heads is applied only to that portion carrying, or actuating, the yarn over which the dupe heads or harness cross, and may be formed as a lifting cumberboard, or supplementary lifting cumberboard, or a lifting bar, for carrying extra lifting wires, fitted underneath, or attached to the jacquard apparatus itself. In case motion is given to a cumberboard, the same is detached from the cumberboard, or boards, carrying the remainder of the heads, or harness, and is mounted on levers, or in slides, or other mechanical means, and caused to lift by cam or crank, or equivalents, at any or every pick, such a distance as may be necessary to enable the "cross" to take place with reduced strain. The heads, or harness, passing through the holes in the boards, are stopped by knots, beads, or other means, which will allow the board to lift them. In place of the cumberboard lifting an extra, and it may be, smaller cumberboard, higher up, may be employed to give the lifting motion to the particular portion of the harness named, and in a like manner, or, by preference, where the harness is fitted up in "necks" or bunches, the board or bar with holes or slots therein may be fitted higher up still, and close underneath or forming part of the jacquard itself, and may be provided with wire hooks or loops, the lower ends of which are attached to the necks of harness, and the top portion to the hooks of both lifts of the jacquards set apart for the purpose. The form of tying up may be of any variety to any extent, and the supplementary lifting hooks may be of any suitable form, and may be forked or not to the wires of the double lift of the jacquard, or may be applied to single lift jacquards as a modification.





PATENTS.

Applications for Letters Patent.

Applying friction to the rotary nippers of combing machines. J. Binns and J. Skinner, Keighley.	30th April	6,365
Adjusting tension bar for taking off warps in looms. G. Hack, Burnley.	10th May	6,970
Belting. J. Holland and J. Lever, Manchester.	28th April	6,310
Bearings for spindles of ring spinning and doubling frames. W. Bodden, Manchester.	2nd May	6,509
Braid machines. H. Hill, London.	12th May	7,085
Bobbins. A. Marriott, R. Bax, C. P. Pickersgill and C. A. Marriott, Batley.	15th May	7,184
Bars for weaving. W. Jungbluth, Cologne, Germany.	19th May	7,453
Breaking hemp, ramie, &c. L. A. Groth, London.	22nd May	7,518
Banding for spinning frames. T. Clarke and R. C. Williams, London.	25th May	7,683
Carriages and combs for lace machines. W. Walker, Nottingham.	7th May	6,763
Combing machines. P. Kelly, Bradford.	12th May	7,075
Combing machines. P. Kelly, Bradford.	12th May	7,076
Carding machines. E. Wilkinson, Halifax.	12th May	7,078
Cotton gins. H. R. Greaves, Halifax.	14th May	7,118
Carding machines. E. Ashworth, Manchester.	19th May	7,425
Carding machines. W. H. Richardson and W. Greaves, Manchester.	19th May	7,464
Combs. T. W. Harding, Leeds.	22nd May	7,512
Carding engines with revolving flats. W. Barker, Manchester.	23rd May	7,575
Cleaning cotton seed, &c., or separating it from adhering fibre.	24th May	7,641
Carding machines. E. Tweedale, Halifax.	24th May	7,620
Carpets. F. B. Fawcett, Kidderminster.	26th May	7,704
Card cylinders on looms. E. Brook, London.	29th May	7,859
Dressing and heckling fibrous material. S. C. Lister and W. Watson, Bradford.	1st May	6,492
Doubling or twisting yarn or thread. P. Smith, London.	3rd May	6,604
Decorating, breaking, and separating fibrous material. E. Brasier, London.	4th May	6,679
Dyeing and sizing yarns. J. and A. Nelson, London.	7th May	6,756
Doubling and twisting. E. W. Wrigley, J. Arden and C. Weir, London.	9th May	6,912
Drag motions for flyer doubling and spinning frames, also for ring and doubling spinning. J. M. Cryer, Bolton.	10th May	6,962
Doubling and twisting yarns. G. H. Holden and J. Ashworth, Manchester.	11th May	7,058
Dyeing apparatus. F. Moore, London.	26th May	7,735
Dyeing apparatus. C. Böhringer, London.	28th May	7,796
Dyeing apparatus. C. J. Alexander, London.	29th May	7,846
Extracting wool oil ("Lanolin") mechanically. A. J. Boulton, London.	4th May	6,669
Finishing cotton goods. E. H. Hargreaves, Manchester.	11th May	7,024
Finishing and raising pile fabrics. J. Worrall and J. Kershaw, London.	11th May	7,057
Faller and hackle machinery. F. Oddy, Bradford.	29th May	7,844
Giving or putting twist to or in yarns, applicable to ring spinning frames. A. Greenwood, Rochdale.	30th April	6,381
Gig mills for finishing woven fabrics. C. Wood, Manchester.	2nd May	6,529
Grinding the flats of revolving flat carding engines. J. W. McConnel and J. Higginson, Manchester.	3rd May	6,599
Grinding flats on the revolving flat carding engine. C. Heywood, Farnworth.	4th May	6,649
Gig mills. J. T. and J. Taylor, Batley.	17th May	7,298
Healds. A. C. Henderson, London.	15th May	7,220
Hosiery machines. H. Igel, Gateshead.	23rd May	7,578
Indicating lengths cut from fabrics. J. Wishart, Bradford.	11th May	7,034
India-rubber fabric. T. Stoward, London.	29th May	7,828
Jacquard looms. E. Hollingworth, Huddersfield.	28th April	6,301
Jacquard machines. Wilkinson Bros., Bradford.	19th May	7,430
Knives for cutting weft-pile fabrics. J. W. Fletcher and W. H. Wiseman, Manchester.	30th April	6,368
Knitting machines. W. B. Maxfield, Leicester.	19th May	7,410
Lubricator for solid oils. W. Martin-Epton, Leeds.	1st May	6,435
Lubricators for loose pulleys. J. K. Clarke, Ipswich.	1st May	6,441
Looms. C. Thompson, Halifax.	2nd May	6,542
Lubricators. R. Brigham, London.	2nd May	6,565
Lubricating machinery in motion. R. Sleading, Clitheroe.	3rd May	6,594

Looms for pile fabrics. J. Wade, London.	10th May	6,989
Looms. T. Blezard and W. Nelson, London.	14th May	7,136
Looms. A. L. Skinner, London.	15th May	7,222
Looms. E. Dixon and H. Clayton, London.	17th May	7,326
Looms. A. Sowden, Bradford.	18th May	7,356
Looms. W. L. Wise, London.	18th May	7,377
Looms. E. Burton and D. Walker, Halifax.	19th May	7,417
Looms. C. W. Fletcher, Leeds.	22nd May	7,509
Looms. S. Yeaton and D. Sutcliffe, Bradford.	29th May	7,824
Mules for spinning. W. Knowles, London.	27th April	6,262
Method of, and apparatus for, making "flake" yarn, or yarn having alternate thicker and thinner portions. J. Pilley and F. Darnbrough, Bradford.	9th May	6,904
Mules for spinning. J. F. and W. H. Poole, London.	9th May	6,911
Mules or twiners for spinning or doubling. J. and E. Cocker, London.	10th May	6,981
Mules. W. Hurst, London.	11th May	7,042
Mules. L. Glover, London.	16th May	7,247
New manufacture of cloth. E. Martin, Halifax.	27th April	6,236
Novel manufacture of travelling caps. C. H. Fitzmaurice and W. H. Buck, London.	7th May	6,811
or velveteens. J. Worrall, London.	11th May	7,055
Picking motions. John Knowles, Preston.	4th May	6,647
Pickers of looms. H. Pearson, Halifax.	9th May	6,898
Preparing yarns in hank. J. Yates, London.	11th May	7,043
Picking sticks. J. Cordingley and J. E. Fletcher, Apperley Bridge.	18th May	7,369
Picking straps. J. W. Landless, London.	19th May	7,440
Printing certain fabrics. J. Knowles, Manchester.	22nd May	7,493
Preparing fibres for combing. E. de Pas, London.	26th May	7,734
Pile fabrics. F. H. Wilke and G. A. J. Schott, London.	29th May	7,822
Roller boards for piece goods. W. E. B. Priestley, Bradford.	14th May	7,130
Revolving shafts. T. Brook, Halifax.	26th May	7,721
Securing cams on to screw-shafts for gill boxes, &c. J. Bailey, Halifax.	27th April	6,235
Sizing or tapeing machines. G. Walsh and C. Wild, Manchester.	28th April	6,312
Scribbling and condenser carding engines. T. H. Blamires, Huddersfield.	3rd May	6,603
Shuttles for weaving bobbin weft or yarn. J. E. and J. Pickup, Manchester.	4th May	6,643
Silk warp threads. A. L. Bill and P. E. Taylor, Birmingham.	4th May	6,675
Securing top rollers upon their spindles. G. Holdsworth, London.	4th May	6,676
Shuttle tongue or peg for calico weaving. F. Fallows, Hyde.	10th May	6,973
Shuttle bobbins. H. Burgess, T. Burgess, and C. Clay, Manchester.	15th May	7,178
Spindles. J. Harrison, Manchester.	15th May	7,107
Sizing machines. T. O. Schweitzer, London.	16th May	7,273
Selvaie protectors. W. E. Heys, Manchester.	18th May	7,393
Spinning frames. J. Barber, Belfast.	19th May	7,414
Spinning frames. S. Dronsfield, Manchester.	19th May	7,424
Stretching fabrics. J. Ashworth, London.	22nd May	7,499
Strap guide for mules. J. Pickford, London.	24th May	7,639
Shuttle guards for looms. B. Ormerod, H. Sharples, and J. F. Davis, Manchester.	25th May	7,671
Shedding motions for looms. B. Ormerod and J. Galloway, Manchester.	25th May	7,672
Textile fabrics. B. Barraclough, Bradford.	28th April	6,316
Treating, washing, drying, and softening fibrous and textile materials. E. Brasier, London.	2nd May	6,570
Treating hides for belting, &c. C. L. Royer, London.	10th May	7,007
Treating flax. S. Craig, London.	14th May	7,155
Wringing sized or dyed yarns, styled the "Excelsior" machine. S. Walker and G. Leek, Radcliffe.	27th April	6,246
Wrapping cotton piece goods. B. and A. Levi, Manchester.	2nd May	6,512
Warping or beaming. W. Gregson, Accrington.	4th May	6,648
Warp or other lace machinery and fabric therefrom. J. Hewitt, London.	4th May	6,677
Wool combing. W. H. Bailey, Keighley.	5th May	6,704
Washing, cleansing, &c., textile fabrics. J. S. Farmer, Manchester.	8th May	6,847
Weaver's loom shuttle tongues. J. W. Holme, Bradford.	9th May	6,887
Waste machines. J. E. Worsley, Liverpool.	17th May	7,319
Winding frames. J. Grayson, London.	17th May	7,323

Patents Sealed.

5,593	5,666	5,711	5,805	5,855	5,857	5,961	6,020
16,367	846	1,074	1,075	1,080	1,083	16,895	2,814
3,280	5,984	6,051	6,128	6,130	6,215	6,260	6,470
6,904	7,299	8,167	8,927	9,358	11,909	14,026	603
1,303	5,200	5,915	6,208	6,526	6,527	6,592	6,778
7,267	9,283	1,450	3,662	4,156	6,136	6,901	6,999
7,003	7,050	7,845	7,586	7,604	15,446	16,472	16,735
17,182	801	2,074	2,143	2,249	2,300		



